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**A**  
New and Complete System  
OF  
**Practical Husbandry ;**

CONTAINING

All that Experience has proved to be most useful in ..

**F A R M I N G,**

EITHER IN THE OLD OR NEW METHOD ;

**With a Comparative View of Both ;**

And whatever is beneficial to the HUSBANDMAN, or  
conducive to the Ornament and Improvement of the

COUNTRY GENTLEMAN'S ESTATE.

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By **J O H N M I L L S,** Esq;

Editor of DUHAMEL's Husbandry.

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V O L. IV.

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**L O N D O N :**

Printed for the AUTHOR ;

And sold by J. JOHNSON, opposite the MONUMENT.

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**M D C C L X I I I**



Practical Laboratory

by E. A. R. I. M. C.

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VOL. IV.

which

which has ever been justly esteemed an occupation worthy of the greatest heroes and philosophers. --- Plato and his Academy, at Athens; Epicurus, and Metrodorus, in the same powerful and polite city; Democritus, at Abdera; the elder Cato, Lucullus, Cicero, and Pliny at Rome; and the emperor Dioclesian, at Salona; have ennobled this Art beyond all encomium. --- In later times, one of the best of men and sweetest of lyric bards, the amiable Cowley, comforted himself in his garden for the flights and ingratitude of the world: Mr. Evelyn's patriotic spirit rendered his plantations a source of useful instructions to mankind: Lord Cobham has left in the beautiful gardens of Stow, a superb monument of his refined taste: Mr. Pope's immortal fame will transmit to our latest posterity the pleasing remembrance of his delightful embellishments at Twickenham; the beauties of which place are now heightened by the elegant taste of Mr. Horace Walpole, in this, as in all other branches of the polite Arts. Here too, I again <sup>a</sup> mention with singular pleasure, and with an earnest wish that many of our illustrious gentry would imitate the fine example, the Honourable Mr. Hamilton's improvements at Pains-Hill, where he has converted what was before a desert, into one of the most beautiful spots in this kingdom. But I am sorry to be obliged to

<sup>a</sup> See *Vol. III. p. 395.*



add, that the gentlemen of distinction and fortune in this country, in general, --- gentlemen whose liberal education and extensive knowledge should naturally open their minds, and turn them to a habit of experiments, from whence the best, perhaps the only perfect, acquaintance with nature can be obtained, leave this delightful field too--too much, to the care and direction of men, who, having taken implicitly from others, and learnt as it were by rote, the little all of their skill therein, and being besides unaccustomed to think for themselves, or to reflect on what they see daily, have neither the understanding, nor inclination, to quit the beaten track in which they have been trained.

M. le Nostre first revived Gardening among the moderns ; M. de la Quintinie proceeded farther ; and, among others of our countrymen, Messieurs London, Wise, Bradley, Laurence, Fairchild, and Miller, have greatly contributed to it's improvement.

I have here endeavoured to divest this Art of all the cant expressions, and unintelligible reasonings, with which most of the writers who have treated of it abound ; in order thereby to allure gentlemen to a greater attention to this most pleasing of all rural employments : --- most pleasing, because it affords an uninterrupted and almost infinite variety of experiments, in which the constant rise and growth of plants give the ingenious and inquisitive husbandman a kind of creative

power. It may be objected, that, to fit a person for the superintendence of a garden, requires so long a series of experience, as few gentlemen are willing to submit to. But those who start this difficulty should consider, that while they are acquiring that experience, their very errors become their best instructors; and that a close attention to the ways of Nature, and to them only, will lead them into her most secret recesses.--If the great Cyrus delighted in entertaining his guests with fruits of his own raising; surely a no less conscious satisfaction will arise in the breast of every hospitable man, when he presents to his friends the choicest products of the labour of his hands: nor will the social glass have a less pleasing relish, because it proceeds from fruit of its owner's growth.--- From this disposition of minds of a superior cast, arose the success, so justly celebrated by Pliny, of the triumphal hands of the ancient Romans; and from the diligent pursuits of such minds it is, that the perfection of Gardening can alone be expected.

I flatter myself that every candid reader of this work will acquit me of having sought occasion to censure other writers: for a carping temper is my aversion. Far from entertaining a spirit of that kind, I have most gladly embraced every opportunity of commending those who have seemed to me to merit praise; and rather than find fault where it was not necessary, I have often passed over in silence, errors which might have been  
noticed



noticed with some severity.---But that silence could not, in justice to my subject, be extended to an Author, who, by his undisputed character for knowledge, and by his most extensive practice in Gardening, is deservedly become the guide of Europe in this branch of cultivation. If, therefore, I have presumed, in some instances, to differ in opinion from Mr. Philip Miller, of Chelsea; and if, through the earnestness of my desire to give the best information in my power, any warmth of expression may chance to have dropped from my pen, when I espouse a practice different from that which he recommends; I earnestly entreat the reader to impute it to the true cause, namely, my zeal to prevent his being mislead by some mistakes which have escaped that celebrated writer: for I take this opportunity of declaring, that if I had not thought him worthy of the utmost attention of every person who shall pursue this most delightful study, I should not, on any occasion, have endeavoured to refute his opinions. The reader must judge between us, in this, on my side very unequal contest. --- It may be said, that I might still have observed my general rule, of being silent where I could not commend: and indeed, I should gladly have persisted in that method, which would have been by far the most agreeable to me, did not the justice which I owe to the Public call upon me to give reasons for my thinking differently from so established a master. --- It was the more indis-

penfably incumbent on me to take fome notice of his inadvertencies, as his book is in the hands of almoft every one, and is, very juftly in moft things, looked upon as the beft of guides.

In this volume, as in all the former parts of my work, I have endeavoured to point out, in the ftrongeft manner, the advantages which arife from a judicious improvement of foils, and from keeping the ground clean and loofe. Wherever fufficient attention is paid to thefe effential principles of all cultivation, the ufe of dung will become lefs neceffary, than can be conceived by thofe who have not experienced it. The importance of thefe objects is fo great, that it cannot be too often, or too ftrongly, inculcated.

Many of my readers may, at firft fight, think that I mean to extend the Kitchen Garden to an unreafonable fize, by allowing to each plant fo much room as is advifed in the firft Section of this fourth part of my Treatife on Hufbandry : but Mr. Philip Miller's conftant directions to that effect, and the unvaried fuccefs of M. de Chateauvieux's experiments; feem fully to juftify what I have faid on this fubject ; and I will venture to affure every gentleman who fhall put it in practice, that he will not find any caufe to repent the trial.

The pleasure and profit arifing from Fruit-trees, which are here the fubject of my fecond and third Sections, are well known. Their product is not only agreeable to the palate, but,  
when



when used with moderation, conduces greatly to our health. To the fruits of the Orchard, and of the various fruit-bearing shrubs here noticed, we owe our Cyder, Perry, and many other excellent and wholesome liquors, the manner of making which will be explained in the sequel of this work.

A due attention to the distempers of fruit-trees, which are treated of in the fourth Section, might, in time, rid us of one of the worst calamities that can befall them. Every hedge upbraids us with our neglect in not properly guarding against them, by carefully destroying the caterpillars and their eggs.

The importance of the fifth and sixth Sections, considered as the foundation of a most beneficial commerce to our colonies, and consequently to their mother-country, is so strongly enforced by the rewards nobly offered by our most excellent Society for the Encouragement of Arts, Manufactures, and Commerce, that I shall not attempt to enlarge here upon the vast advantages which must arise from a proper culture of the Vine, and of Olive trees, in suitable parts of our immense possessions in America.

I close this volume with ample directions for the culture and management of Hops, which are a necessary ingredient in the common healthy drink of this country, the manner of brewing which, and of making and managing all other fermented liquors, will be treated of fully in the beginning of my next Volume.





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C O N T E N T S  
O F T H E  
F O U R T H V O L U M E.

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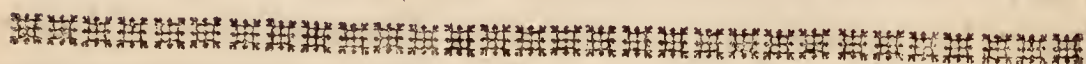






# PRACTICAL HUSBANDRY.

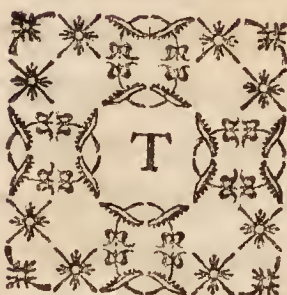
## PART. IV.



### CHAP. I.

#### OF GARDENING;

SO FAR AS IS PROFITABLE TO THE FARMER,  
AND TO THE COUNTRY GENTLEMAN.

HE generality of writers upon this subject, and indeed most gardeners, in their practice, have, at least till of late years, treated the pleasure garden, the fruit garden, and the kitchen garden, as three quite distinct and separate objects, not only in point of culture, but even of situation, soil, and inclosure. They are undoubtedly right as to the first: but I see no reason for disjoining the two last, unless it be in written accounts, where, for the sake of

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greater

greater order and perspicuity, and for the convenience of the reader, their several products, and the different ways of managing them, may, with propriety, be given singly, as will be the method here.

The pleasure or flower garden, being intended solely for ornament and recreation, does not belong to this work, the main design of which is utility. I therefore shall only observe, in relation thereto, that the gentleman who can afford to be at the expence of such a garden, for the laying out, planting, and managing of which he will find ample and excellent directions in Mr. Miller's Dictionary, will, of course, place it in a properly conspicuous part, where it may afford the greatest entertainment to the eye. Consequently he will order it to be made next to, or just against, the back front of his house, from whence a descent of at least three, but rather of six or seven, steps will singularly embellish the whole. He will allow room for a sufficiently extensive lawn, which, if it be the first thing that strikes the sight, will have an elegant effect; for spacious walks, one of which, so contrived as to be perfectly dry, and every now and then to lead to a shady place, or into plantations of shrubs, where a person may walk in private, should surround the whole garden, were it only for the benefit of exercise. He will have wildernesses, groves, green-houses, &c. and he will be particularly careful to provide plenty of water, for cascades, fountains, and winding streams, which last, if so conducted as to imitate nature, will give life and beauty to the whole, besides being of necessary use for watering the ground. Statues and vases, judiciously disposed, are also, here, pleasing and proper objects: but neither these, nor any of the buildings in the garden, whether temples, grottos, alcoves, or other, should, by any means, be too much multiplied, or crowded.

Mr:



Mr. Miller, to whom I again refer for the best instructions on this head, observes very rightly<sup>a</sup>, speaking of pleasure gardens in particular, that the great art of laying them out, is to adapt their several parts to the natural position of the ground, so as to have as little earth to remove as possible; for this is often one of the greatest expences in making of gardens: though it may with truth be affirmed, that, wherever it has been practised, nine times in ten it has proved for the worse: so that if, instead of levelling hills to form large terraces, stiff slopes, and even parterres, or sinking of hollows and raising of hills, the surface of the ground had been only smoothed and well turfed, this would have produced a much better effect; and have been more generally approved, than the greatest number of those gardens which have been made with an infinite expence both of time and of money.

The boundaries of these gardens, whatever they are fenced with, should be carefully hid by plantations of flowering shrubs, intermixed with laurels and other ever-greens, to conceal the fences, which have a disagreeable look when they are left naked and exposed. All the boundaries should not be seen from any one point of view: and if the country around affords a variety of pleasant prospects, it will be right to bound the pleasure garden by an ha-ha ditch and wall, to lay open those views.

Neither the husbandman, nor the country gentleman of moderate fortune, who prefers utility to ostentatious show, can set about an easier or more profitable branch of culture, than that of the kitchen and the fruit garden, which may very properly be intermixed, and occupy one and

<sup>a</sup> *Gardener's Dict.* Art. GARDENS.



the same spot of ground, since they both require a good, deep soil, and nearly the same exposure. The walls which inclose the kitchen garden, in order to secure it's product, will be extremely serviceable for fruit: and, if elegance should be studied, this united garden may still be placed out of view from the dwelling house.

The chief things to be considered in the choice of a spot of ground for a kitchen and fruit garden are, the situation, the soil, the conveniency of water, the extent most proper to be inclosed, and the manner of inclosing it, and laying it out.

If the husbandman can choose his soil and situation for a garden, the former should be rich, rather stiff than light, and considerably deep. Nor is a moderate degree of moisture here by any means an objection. The situation should be nearly level: because heavy rains would wash away the richest part of the mould, if the declivity were considerable. If he has not a level spot near his house, the ground intended for the garden may be made into flats with terraces supported by strong walls, which will become useful for fruit trees. A gentle inclination may be preserved, to answer Mr. Miller's idea of having one part of dry ground for early crops, and the low part for late crops, in order that the kitchen may be the better supplied throughout the season with the various sorts of herbs, roots, &c.

He should not be discouraged at some seeming disadvantages to which his soil and situation may expose him; for no difficulty is so great, but that it may be overcome by care, industry, and perseverance. Of this we have a striking instance in the following part of a paper which D. J. Beale read to the Royal Society, some years ago, with a view to the improvement of gardening in Scotland.

“ I had

“ I had <sup>b</sup> several times conferences with Sir  
“ Robert Morray (who was an honour to his coun-  
“ try, and a blessing to the place where he abode)  
“ concerning esculent and olitory gardens, and  
“ (under one) nurseries of fruit trees, and other  
“ useful vegetables in Scotland. I represented,  
“ that, almost within my memory, they are be-  
“ come the chief relief of England; that austere  
“ fruit has been found to yield the strong and  
“ sprightly liquor which resembles the wine of the  
“ grape; that the return of gain from gardens is  
“ great and speedy; and that nurseries are neither  
“ a chargeable nor a burthenfome addition, but a  
“ motive of encouragement to persevere in the  
“ noblest kind of agriculture. Sir Robert granted  
“ all I said: and I am sure he executed all that  
“ he could for the benefit of his own country,  
“ and of this. But, said he, there are so many  
“ rocks, and such bleak winds, in Scotland, that  
“ it can hardly draw in the same yoke with  
“ England, for gardens and orchards. I replied,  
“ that, in Devonshire and Cornwall they fence  
“ their gardens and orchards with Flanders furze  
“ and tall holly, fromt he sea winds; that they have  
“ lofty firs and goodly pines in Scotland; and that  
“ New England, where the winds are as keen,  
“ and the snow and frosts as deep, and as long  
“ lasting, as in many parts of Scotland, is never-  
“ theless full of fruitful orchards. And if Scotland  
“ be farther in the north, yet Norway is rich in  
“ bosage; and the seeds of the hemlock fir,  
“ spruce, and cedar, from New England, New-  
“ foundland, and Virginia, may perhaps rejoice in  
“ the exchange of Northern America, for the  
“ north of this island.

<sup>b</sup> *Philisoph. Transf. No. 116.*



“ This, I told Sir Robert, I durst undertake ;  
 “ that when Edinburgh and their chief towns and  
 “ universities shall plant kitchen gardens, as we do  
 “ now in England, they shall receive their grate-  
 “ ful reward the first year, and bear the charges of  
 “ their nurseries abundantly, and so hold on, and  
 “ within seven years secure their posterity of the  
 “ benefit, and delight themselves with the fruit of  
 “ their pleasing labour.

“ Now for fertilizing rocks, I made bold to re-  
 “ peat it often, that, within a day’s journey of  
 “ the heart of England, I could shew three gardens,  
 “ the best that I have seen for flowery beauties,  
 “ English ever-greens, and sallets all the winter  
 “ long ; all these on a hard rock, in most places  
 “ but one foot deep under earth, in some two,  
 “ and in very few three, with very lofty hills  
 “ close to the south side, the declivity of the gar-  
 “ dens due north, and the rock perfectly bare next  
 “ to the walls on the north side. I likewise saw rich  
 “ hop yards in the same case, but in deeper  
 “ ground, next to the garden on the south side :  
 “ and these northern hop yards escaped many blasts,  
 “ which seized on the hop yards on the south side  
 “ of the hill. On the steep ascent on the north  
 “ side of one of these rocky hills, where no  
 “ plough could come, I saw a gentleman plowing  
 “ up the shallow turf with a hand plough, for  
 “ flax ; and I saw good flax grow there, to the  
 “ largeness of a village-field. His hand plough  
 “ had a stem of ash, or sally, about seven feet  
 “ long, and a plate at one side near the end, to  
 “ turn the turf ; a coulter to be let out shorter or  
 “ longer, to cut the turf four, five, or more inches  
 “ deep, as the land permitted, and a small iron  
 “ wheel. This hand plough the master and the  
 “ man, by turns, drove before them with a walk-  
 “ ing speed ; having leathern aprons before them,  
 “ to



“ to save their cloaths. For the causes of this  
“ hardy fertility, let philosophers account. I am  
“ sure of the truth of what I write.

“ It is no hard task to shovel down the shallow  
“ and mossy turf, from the deepest declivities of  
“ rocks, into places where it may have a recepta-  
“ ble or stay, and there, with the spade, to mix  
“ and impregnate it with compost for gardens or  
“ vineyards. There too, the tenth part of an acre  
“ in gardening may yield more profit, than ten  
“ acres of ordinary tillage in a corn field.”

On the other hand, we have many proofs that wet, and even very marshy, grounds have been converted into excellent kitchen gardens, after they have been drained. Such was, formerly, all that large part of Paris which still retains the name of *le marais* (the marsh); and such were, evidently, several of our now most profitable gardens around London. The Marquis of Turbilly has given us farther instances of this truth in several of his noble improvements before mentioned; and the Memoirs of the truly patriotic Society of Berne remark very justly<sup>c</sup>, that all legumes and pot-herbs thrive perfectly well in the black, rich, moist, and somewhat rising, grounds which most commonly skirt the borders of marshes.

As warmth is essentially necessary to a garden, it is advisable that the exposure of the ground intended for this purpose be to the south-east, or south; and that it be protected from the north and north east, either by high grounds, or plantations of lofty trees at a small distance. — Fruit trees require to be likewise protected from the south-west and west, which are apt, in the autumn, to shake the fruit.

<sup>c</sup> *Observations, &c. pour l'année 1762, p. 101.*

The husbandman should here spare no trouble or expence to render his soil of a proper quality and depth: and if it be not naturally so, he must have recourse to one or other of the methods before directed for the improvement of soils<sup>d</sup>, according to the nature of his ground.

Whatever the soil be, the mould in which the plants are to live and thrive should be deep enough to afford their roots full room to extend themselves. It appears by several experiments related in my second volume, that the roots of many plants, not excepting even annuals, pierce to the depth of eighteen inches, and more. To allow therefore a sufficiency of room, though perhaps more than may be really wanted, a depth of three feet of good mould should be allotted them here: and if the soil underneath is clay, or retentive of water, which would be apt to chill the roots of plants, it will be right to exceed even this depth.

Trenching is the most effectual way to obtain a considerable depth of well loosened mould: The common method of doing this, when the soil underneath is clay, is to begin with digging a trench four or five feet wide, either along or across the whole ground; then to lay in the bottom of it, about half a foot thick, long dung, fern, leaves of trees, rotten sticks, weeds, or any other such like trash\*, to rot and keep the soil from binding; then to fill this up with the earth dug out of the next adjoining trench, laying uppermost the spits that were lowest, and so to continue till the work is finished, without ever going deeper than just to the clay, though the surface be never so shallow. But if the clay be dug into, and part of it be

<sup>d</sup> See *Vol. I. c. I.*

\* But very great care should be taken, that there be not any seeds of weeds mixed with it: for they would afterwards be brought up towards the surface, grow, and become extremely pernicious.



turned up and mixed with the other earth, it's bad qualities will soon be corrected by the influences of the air, rain, and one winter's frosts; it will become good and fertile mould, and the depth of the staple will be increased thereby, especially with the addition of a little drift sand, coal, or other ashes. The best time for trenching of land, that it may receive the benefit of being well mellowed, is the beginning of winter; when also, being moist, it is easy to dig.

When the mould on the surface is but shallow, and lies on a bed of sand, gravel, or loose earth, it will be advisable to lay a layer of stiff earth, inclining to clay, at the bottom of the trench. This will be more especially necessary for the growth of trees, or plants whose roots naturally pierce deep: for by means of this earth, those roots will spread horizontally in the mould, instead of striking down, as they would otherwise do, into a barren earth, which would immediately make the trees decay and become stunted. And another advantage attending this method will be, that as water cannot so easily descend through this stiffer soil, the earth will be thereby preserved in a so much moister state.

The general practice of gardeners is regularly to trench their ground, and lay it rough in the winter, without sufficiently considering the quality of the soil, or the nature of the earth which lies underneath. But a little reflection would convince them of their error. — Let us, in this light, see what is the effect of trenching in various soils. If the ground is naturally light, and lies on a bed of sand or gravel, it is to be feared that every substance brought to improve the soil, together with it's finest and richest particles, will be carried down into that sand or gravel. Does not too frequent trenching contribute to this loss? as does  
likewise



likewise laying the surface rough in the winter: for the rains wash the finer mould into the hollow places, from whence, the depth of the soil being least there, it is most readily carried down into the loose earth underneath. If the soil underneath is stiff, frequent trenching is proper in order to bring back to the surface the rich mould that has been washed down: and if it be naturally strong, the laying of it rough in the winter is an advantage, because the winter's frosts will moulder it's tough strong particles.

This method of preparing the ground is, undoubtedly, expensive: but it's fertility afterwards will yield an ample reward.

Plenty of water is absolutely necessary in this garden, and therefore great care should be taken to provide it, in such manner that it may be come at as easily as possible. If a sufficient supply of it can be obtained from the neighbouring grounds, two or three basons should be made in different parts of the garden, if it be a large one; for when the water is to be carried to a considerable distance, the expence attending this necessary business will be great, and there will be danger of the plants suffering for want of it; labourers being very sparing of their work, especially when it is toilsome, unless they are well looked after. The size of these basons should be proportioned to the quantity of water that will be wanted, or with which they can be supplied: but their depth should not exceed four feet, for fear of accidents, if people should chance fall into them: besides which, deep water is not so well warmed and tempered by the sun and air, as when it is shallow.

The methods before directed <sup>e</sup> for collecting and preserving of water in ponds or reservoirs in

<sup>e</sup> See *Vol. III. p. 389.*



the field, are equally applicable to the making and replenishing of these basons in the garden. But it will be proper here to add the following more particular cautions and instructions of Mr. Miller, who, after observing<sup>f</sup>, that the best time of the year for lining these basons with clay, particularly in loose or sandy land, and for afterwards covering that clay with a thick layer of coarse gravel, is in autumn, when the sun is declining, and the weather temperate, advises, “as a farther means of securing this clay from being cracked by the heat of the sun, or by frost, to lay upon the rim or top of it, around the sides of the bason, a stratum of sand, then a stratum of good earth, and upon this a layer of thick turf. The grass thus laid will root in the mould underneath, and bind the whole firmly together: and it should be laid as far down the inside of the bason, as the water is apt to shrink to; that no part of the clay may be wholly exposed to the weather.

“No trees or shrubs should be suffered to grow near these basons, lest their roots should penetrate into them, and thereby occasion holes through which the water would find an easy passage. Neither should these reservoirs be made near to tall trees, because the shaking of them, by violent winds, would be apt to loosen and crack the clay.

“In countries where clay proper for this purpose cannot be easily had\*, these basons are frequently lined with chalk beaten into fine powder, and made into a sort of mortar, which is rammed

<sup>f</sup> *Abridgment of the Gardener's Dict.* Art. WATER.

\* The true sign of good clay, says Mr. Miller, (meaning particularly clay fit for this use,) is, that it be close and firm, without any mixture of sand, and that it be tenacious and fat in handling. It's colour matters not. *Abridgment of the Gardener's Dict.* Art. WATER.



down and worked very hard and firm all over their inside. This cement holds water very well, if the pond be not suffered to remain too long dry: for when this happens, the sun and wind are apt to crack the chalk, and these cracks generally extend through it's whole thickness, so as to let out the water.

“Some line these ponds with bricks laid in terras, which is a good method where the ground is very loose and sandy, because, when these walls are well built, the surrounding earth may be rammed down close to them, so as to prevent it's falling away, or settling from them. But, as heat is apt to crack the terras, no part of this lining should be left long dry and exposed.

“Others again use for this purpose a cement of powdered tile and lime, two thirds of the former to one third of the latter, beaten well together, and worked up with but little water: for the stiffer it is, and the more it has been beaten, the better it will be. With this cement they cover the surface of the walls of basons about two inches thick, laying it very smooth, and taking great care that no sticks, straws, or stones be mixed with it. This is generally done in dry weather; and as soon as the whole inside of the bason has been plaistered in this manner, it is rubbed over with oil or bullock's blood, and the water is let in immediately after. This cement has the property of hardening under water, so as to be equal to stone; and it will continue as long sound.”

Where a supply of water for basons and ponds cannot be obtained, wells must be dug, and the water taken out of them should be exposed to the sun and air for some time, before it is used, because says Mr. Miller, the rawness of this water, when fresh drawn, is not agreeable to the growth  
of



of vegetables. — How far this may have been actually experienced, I cannot say. — If by rawness, he here means coldness, the observation may be just; because a great degree of cold applied suddenly to plants, especially in warm weather, may so check the circulation of their juices, as to retard their growth. But if he means by it that hardness which is generally found in all well-water, the experiments mentioned in the third volume of this work \* seem to refute that old, but mistaken opinion.

The size of this garden should be proportioned to the wants of the family; but with a much larger allowance of ground than is usually allotted, in order that the plants may be benefited by stirring the earth between them whilst they grow. The great and manifest advantages of this practice, especially in the culture of pulse and garden plants, have been so evidently shewn by numbers of experiments related in the former parts of this work, that I cannot but again recommend it here as an object of high importance.

It should be inclosed with a wall, either of brick or stone; but brick is best, for the greater convenience of nailing up the fruit trees which are to be planted against it. The thickness of these walls should be proportioned to their height, which some run up to twelve or fourteen feet, or more: but nine or ten will be enough for almost any kind of fruit; and in this case thirteen inches, that is to say, a brick and an half, will be a sufficient thickness; though two brick will be better, for duration. Their inside should be built as smooth as possible, and, to strengthen them against high winds, piers should be run up with them, at the distance of about twelve or

\* Page 402. 403.



fourteen feet from each other, according to the usual extent of the fruit trees for which they are intended. As to pears, which spread very wide, and frequently grow much above the height here mentioned, they do not require the assistance of a wall; unless it be some of the latest winter sorts, and these the curious, who will be at the expence, may plant against walls built on purpose for them. These piers may project six or eight inches on the outside of the wall, for the sake of greater solidity; and they should advance about four inches on the inside, for the convenience of fixing to them trellises, which will be spoken of hereafter in the article of fruit gardens.

If the quantity of walling which surrounds the kitchen gardens be too little to furnish the desired supply of fruit, a cross wall may be built through the middle of this ground; or, where the size of the garden will admit of it, there may be two cross walls: but these walls must not, by any means, be less than eighty or an hundred feet asunder. More will be yet better.

Mr. Miller<sup>g</sup> is clearly of opinion that the best aspect for walls in England, is to have one point to the eastward of the south; because these will enjoy the benefit of the morning sun, and be less exposed to the west and south-west winds (which are very injurious to fruits in this country), than those which are built due south. “ I know, says  
 “ he, that many persons object to the turning of  
 “ the walls the least point to the east, on account  
 “ of the blights which they think come from that  
 “ quarter in the spring: but, from many years  
 “ experience and observation, I can affirm, that  
 “ blights as often attack those walls which are  
 “ open to the south west, as those which are built

<sup>g</sup> *Abridgment of the Gardener's Dict.* Art. WALLS.



“ to any other aspect; and I believe those who  
“ will be at the trouble of observing for seven  
“ years, which aspected walls suffer most from  
“ blights, will find those which are built with a  
“ point to the eastward of the south, as seldom  
“ blighted as those which are turned to any other  
“ aspect; therefore in the contrivance of a kitchen  
“ garden, there should be as great a length of  
“ these walls built, as the situation of the ground  
“ will admit.

“ The next best aspect is due south; and the  
“ next to that south-east, which is preferable to  
“ the south-west, for the reasons before assigned:  
“ but as there will, for the most part, be south-  
“ west and west walls in every garden, these  
“ may be planted with fruits which do not  
“ require so much heat to ripen them, as those  
“ designed for the best walls: but wherever there  
“ are north walls, those will only be proper for  
“ baking pears, plums, and morello cherries for  
“ preserving; or some duke cherries may be  
“ planted against these walls, to supply the table  
“ till peaches, nectarines, and plums are ripe.”

In whatever manner the walls are made, this garden should be well sheltered from the north and north-east, by a distant plantation of high timber trees, if nature has not otherwise provided a sufficient defence from those quarters.

In the distribution of this garden, particular care should be taken to lay the walks out so as to obtain the greatest convenience that can be for supplying each part of it with manure and water, and as easy access as possible to its different quarters, which may be surrounded by a border planted with espaliers. The manner of forming espaliers will be directed when I come to speak of the training of fruit trees.

These walks should be firm enough to bear at least the weight of a loaded wheel-barrow, and wide enough for the convenient carriage of whatever there may be occasion to bring into this garden, or to carry out of it. Mr. Miller is against making them of gravel; because, as it will very often be necessary to wheel manure, water, &c. upon them, they would soon be torn up and rendered unsightly. For the same reason he rightly condemns turf walks here, and advises, as the best for a kitchen garden, those which are laid with a binding sand. In effect, these are the easiest kept of any: for when either weeds or moss begin to grow, scuffling of them over with a Dutch hoe in dry weather, and raking them over a day or two after, will render them as clean as when they were first laid: — or if they are covered with dust taken from great roads, this will bind and become very firm.

If the soil is stiff and apt to retain water, narrow under-ground drains should be made by the sides of the walks, to carry off that wet: and where the ground is naturally moist, lime rubbish, flints, chalk, or any other such material as can be procured with the least expence, should be laid at the bottom of these walks; or if neither of these can be had, the sand should be laid thick upon a bed of heath or furze, and the water will drain through this, so that the walks will be firm and good in all seasons.

The same means will also help greatly to drain away the superfluous moisture of the whole ground, if the soil should be naturally too wet; or, if they are not sufficient, more under-ground drains may be made across different parts of the garden, according to it's declivity: for most kitchen plants are hurt by too much moisture in winter,



winter, and trees never produce good fruit when their roots lie in water.

If each quarter of the kitchen garden is to be encompassed by espaliers, the walks which divide those quarters should be wide enough to afford admittance to the warmth of the sun, and to a free current of air. In this case they may be, as Mr. Miller directs, six feet wide in small gardens, and ten or twelve in extensive grounds. On each side of these walks, the espalier should be planted in a border four or five feet wide; by which means the two espaliers will be far enough asunder for their roots never to injure one another. These borders may be sown with small fallowing, or any other herbs that do not continue long or root deep; so that no ground need be lost, and the continual stirring and manuring of it for these productions will be of great service to the roots of the trees.

The borders along the south and other walls that have a good exposure, should, in the opinion of this experienced gardener, be at least eight or ten feet wide, in order to allow the roots of the fruit trees that are planted against them full room to extend themselves. Such of these as face the south may be sown for early crops of plants which do not root deep, and those that are exposed to the north will do for late crops: but no deep rooting plant, especially peas and beans, should ever be placed too near the trees; though most gardeners are apt to transgress greatly in this respect, as well to preserve their crops in winter, as to bring them forward in the spring: both which ends might be answered equally well, and without prejudice to their fruit trees, by making reed hedges in some of the warmest quarters, and sowing close to them their early peas, beans, &c.



It is a general opinion, that plants which are sheltered by walls, so as to be defended from nipping winds, and to have the additional warmth of the reflected heat of the wall, are least liable to be destroyed by the winter's frosts; for which reason it is that early crops are most commonly sown in borders so situated. — The sun will undoubtedly give greater motion to the sap of plants there, and they may, for this reason, seem to be the stronger. But if we consider, that the walls yield no protection against the severity of the night's frost, and that the effect of this frost must be most severely felt by plants whose sap is in the greatest motion; we may rather fear that this situation, instead of being beneficial, may, in fact, counter-act the very end proposed. — To be satisfied of this fact, a friend of mine sowed some early peas in a border at the foot of a south wall, and at the same time some others, of the same sort, in an open field adjacent to the garden; and he found, that the latter were by much the least damaged by the winter's frosts; nor did he perceive any great difference in the season of their blooming.

A square, or an oblong form, will be most agreeable to the eye: but it matters not, in other respects, what shape this garden is of; especially as all gross irregularities may easily be hid in the laying of it out. Thus, when this is done, any of the slips cut off by the garden wall, may, if large enough, and well exposed to the sun, be set apart for a place to make hot-beds for early cucumbers, melons, &c. One would wish this spot to be as near as possible to the stables, for the convenience of supplying it with dung; and to have it without the wall is certainly most eligible, because that will save a great deal of filth and litter in the garden, and remove from the nose and eye an  
object



object which is not of the most pleasing kind. If this slip is long enough to admit of an annual succession of new beds during two or three years, they will be much better than when they are continued more than one year on the same spot: and as it will be absolutely necessary to fence this melon ground, as 'tis called, round with a reed hedge, this may be so contrived as to be moved away in pannels, in such manner that there will be no occasion to shift any thing more than one of the cross partitions, or fences, each year.

The importance of the precept, particularly here, will justify my mentioning again, that the dunghills set apart for this, or for any other purpose of gardening, or agriculture, should be carefully kept clear from weeds: for if weeds are suffered to scatter their seeds upon the dung, they will be brought into the garden, or other cultivated ground, shoot up, damage every crop of useful plants, and occasion a perpetual labour to extirpate them.

Another caution which Mr. Miller gives, as absolutely necessary to be observed, is, to carry off all the refuse leaves and stumps of cabbages, the stalks of beans, and haulm of peas, as soon as they have done bearing; because the ill scent which most people complain of in kitchen gardens, is wholly occasioned by these things being suffered to rot upon the ground. The leaves of the cabbages may be given to hogs, or other animals, while they are fresh, and the rest of this trash may be thrown upon the dunhill, which it will help to enrich.

I must here point out a too common neglect of most gardeners, which is, the letting of their plants remain on the ground till they have ripened their seeds, and wither; not considering that whilst a plant is full of sap, it preserves the earth



in a loose state, probably by means of the moisture perspired from it's roots; but that, when permitted to stand till it's seed is ripe, or the plant withers, it then leaves the impoverished earth dry and hard; being itself become entirely void of sap.

The most important points of general culture here consist in good digging, keeping the ground clean, manuring the soil, and allowing proper distances between the plants, according to their several kinds and growths. But as the various productions of the kitchen, and those of the fruit, garden require very different treatment, though in the same inclosure; it will now be right to consider them separately.

## S E C T. I.

### OF THE KITCHEN GARDEN.

**T**HIS, if it be rightly managed, is the most useful and most profitable spot of ground that either the country gentleman, or the husbandman, can cultivate. It is indispensably necessary to every family in the country, where, the nearest market town being frequently far off, but poorly furnished with plants and roots, and that only on certain stated days, perhaps not oftener than once a week, there is no other way to have a variety, or even a sufficiency, of this exceedingly healthful food, one of whose great excellencies consists in it's being fresh gathered.

Two essential rules to be observed in the general management of a kitchen garden are, never to crowd the ground with more plants than it is able to nourish properly; and never to let any part of it remain unoccupied, for want of a due succession of crops. By this means the master, whom I would advise always to be his own gardener, at least



least so far as personally to direct and superintend whatever is done, may have his table constantly supplied with such vegetables as he likes best, no part of his ground will lie useless, and each of it's products will be brought to perfection.

The common practice is, not to dig deeper than from nine to twelve inches, except when the ground is trenched: But the great success of M. de Chateaufvieux's experiments, related in the former parts of this work, shews that it ought to be well loosened to the depth of at least eighteen or twenty inches, as his generally was; because all plants are singularly benefited by having a good depth of mould to grow in. The same experiments, confirmed by very many others, have likewise demonstrated, that their flavour is highly improved, and their size greatly increased, by stirring of the earth around them whilst they grow. This is particularly remarkable in plants which are sown early, and remain long in, or on, the ground, such as carrots, cabbages, &c. for which this culture should be repeated three times, at proper seasons, as before directed<sup>a</sup>; with this difference only, that what is done with a plough in the field, must here be performed with a spade. But in order to enjoy the full advantages of this method, the plants must be sown, or set, in beds, either in single or double rows, according to their size; and these rows must be at such distance from each other, as to allow sufficient room for digging between them.

To avoid the tedious prolixity, and numerous repetitions, which would be the necessary consequence of giving a separate account of the culture of each particular plant proper for the kitchen garden; I shall class together (for it is not my

<sup>a</sup> See *Vol. III. Part 3. c. 1. p. 149. et. seqq.*



business here to make botanical distinctions) those which require the same, or nearly the same, treatment; and then, enumerating them alphabetically, for the greater convenience of the reader, point out wherein any of them are bettered by a different management. The general heads under which I shall range them, are, 1, Those which are cultivated for their roots, whether of the tap, or of the bulbous kind. 2, Such as are cultivated for their tender shoots, heads, or leaves. 3. Legumes. 4, Salleting. 5, The sorts commonly distinguished by the appellation of sweet-herbs; and 6, those that are raised in hot-beds.

## ARTICLE I.

### *Of Roots. proper for the Kitchen Garden.*

**B**EET, whether white or red, should be sown in March, in a deep and light soil. The former is cultivated for it's leaves only, and will therefore be mentioned again in the next article. The latter is esteemed for it's root, which, when boiled, cold, and cut into thin slices, makes a grateful mixture with winter sallets. The reddest and largest roots are the tenderest and most esteemed: consequently the principles of the new husbandry are extremely applicable to this plant, and we have accordingly seen<sup>b</sup> that M. de Chateauneux had beet roots, managed this way, which measured from five to sixteen inches in diameter towards their top, or thickest part, though raised in a common field, and cultivated only with the horse-hoe.

<sup>b</sup> Vol. III. 176.



Their usual culture in the garden is, to hoe the ground carefully when the plants have put out four leaves, to cut up all weeds, and to thin the plants till they stand ten or twelve inches asunder. In three weeks or a month more, the hoeing and weeding should be repeated; and in six weeks after this, the ground should be hoed over a third time, and the plants of the red beet, of which I now speak, should be thinned again till they are eighteen inches from each other, if it be intended that they should grow to the largest size. This is generally the last hoeing bestowed upon them: for their leaves, which are then large, soon spread so as to cover the whole ground, and effectually keep under any weeds that may afterwards spring up. These leaves are most commonly of a deep green, or purple colour.

Instead of this method of cultivating beet, I am sufficiently warranted by M. de Chateauvieux's success<sup>e</sup>, to recommend sowing them in rows, in which they should stand fourteen or fifteen inches asunder in the row, and, instead of the hoeings before mentioned, to dig the ground between the rows at least a spade deep, as often as weeds appear, or in proportion to the greater dryness of the weather; for, though it may seem a paradox to some of my readers, every instance of M. de Chateauvieux's practice proves, that, even in the greatest droughts, each stirring of the earth with the horse-hoe, gave fresh vigour to the plants.

The beet roots will be fit for use in autumn, and will continue good all the winter: but they will begin to grow hard and stringy in the spring, when they will begin to shoot. The seeds of this plant, by which only it is propagated, ripen about the end of August, or in the beginning of Septem-



ber. They are round, rough, and about the bigness of a middling pea. To obtain them in perfection, some of the finest roots that have been preserved from the winter's frosts are replanted in March, and let run up to seed. The kitchen gardeners about London, in order to save ground, frequently sow the red beet with carrots, parsneps, or onions, and afterwards draw up their carrots and onions when they are young, to make room for the growth of the beet. But unless they pull them up very young indeed, it is much better to sow the beet separately.

*Carrots* delight in a warm, light, soil, which should be dug very fine to the depth of at least two spades; because they are very apt to grow forked, and to shoot out lateral roots, if they meet with any obstruction. Dung, if it be not very thoroughly rotted, will make them do the same, and also occasion their being worm-eaten: for which reason it is best not to dung the ground the same year that it is sowed with carrots; especially as all the experiments in the new husbandry, and particularly those of M. de Chateauvieux in relation to this plant<sup>d</sup>, prove that good culture will, alone, produce much finer and better tasted roots. However, if dung is used, great care should be taken to break and divide it's parts as much as possible.

Those who are fond of young carrots may sow a succession of crops in their garden, at any time between the beginning of January, if the weather be open, to the end of March. For the very early crops, they should sow in warm borders, under walls, pales, or hedges, but not quite close thereto, lest the young plants should be drawn up so as not to form tolerable roots. The breadth of about a foot, between the carrots and the fence,

<sup>d</sup> Vol. III. p. 176.



may be sown with lettuces, or any other young salleting.

March is the season to sow carrots for a full crop. April and May are not accounted proper months for this sowing, because, if the weather should prove hot and dry, the plants will run up to seed before their roots have any bulk. Seeds sown in July will produce an autumnal crop; and at the end of August others may be sown to stand through the winter, and yield early carrots in March, before those of the spring sowing will be fit to draw: but they will often be tough and sticky, and seldom well tasted. — The red, or orange carrot, as it is called, is preferred to the yellow.

It is pretty difficult to sow carrot seed equally, so as to prevent their coming up in patches; first, because they are very apt to cling together; and secondly, because they are so light, that a little wind, at the time of sowing, easily baffles all the gardener's care. To remedy the former of these inconveniencies, they should be mixed and well rubbed with dry sand, which will separate them<sup>e</sup>; and to guard against the latter, a calm day should be chosen. They should then be sown on well pulverised ground, laid as even as possible, to prevent their falling together into hollows; and immediately after this, the mould should be trodden pretty close, to bury them. That done, it should be smoothed with a rake. They seldom come up in less than five or six weeks. The manner of cultivating them whilst they grow, is the same as before directed for beet roots; like which they are amazingly benefited by digging and turning up the earth between them, to the depth of a spade is best, instead of only scratching it's surface with a hoe, as is the common way. If they are to be

<sup>e</sup> See Vol. III. p. 174.



drawn young, five or six inches may be a sufficient distance between them: but if they are to grow large before they are pulled up, they should be eight or ten inches asunder every way: and in this case they should be thinned accordingly at their first hoeing; for plants which have been stunted or cramped in their early growth, never recover their full strength.

No other crop, if we perhaps except parsneps, which require exactly the same culture, should be sown with the carrots; because, if all the seeds grow, what one sort gains, must be lost by another. Leeks, onions, radishes, &c. should therefore be excluded here; though many of the kitchen gardeners near London still continue to sow them all together.

The way to preserve carrots for use during the winter and spring, together with the best method of obtaining, gathering, and keeping their seeds, have been directed in my third volume<sup>f</sup>, and therefore need not be repeated here.

*Eschallots* are propagated by parting the cloves or offsets of their roots, and planting them in a light soil; for though they will grow in almost any ground, they will increase most plentifully there. The best time for setting them is towards the end of January. They must be taken up as soon as their leaves begin to wither; or they will rot if left long after in the ground.

*Garlick* is likewise propagated easily by separating the cloves or small bulbs of its root, and planting them, in the spring, about four or five inches asunder. They too will thrive in almost any soil or situation: but their increase will be surprising in rich ground. About the beginning of June, their leaves should be tied in knots, to



prevent their spindling or running to seed: and this will also greatly enlarge their bulbs. As soon as their leaves begin to wither and decay, which will be about the middle of July, the roots should be taken up, and kept dry for use.

If this plant is propagated by seeds, these may be sown in a border of common earth, either in autumn, soon after they are ripe, or in the ensuing spring: They will soon come up, and require no farther care, but to keep them clear from weeds; for every species of garlick is very hardy. In the following autumn, the plants thus raised may be transplanted into the borders where they are to remain.

*Horse-radish* will thrive best in a rich soil which has been trenched at least two feet deep: more will be better, if the staple permits. It is propagated by offsets which have a bud upon the crown, or by replanting the tops of the old roots that have been dug up for use: no matter how short they are, provided they have a bud. October and February, the former for dry lands, and the latter for moist, are the proper seasons for planting these cuttings or offsets, which is done by placing them about four or five inches asunder, with the bud upward, in a trench ten inches deep, and then covering them with the mould taken out of that trench. With this management only, and keeping the ground clear from weeds till the plants are strong enough to master them, the roots of the horse-radish will grow long, and strait, and will be fit for use the second year.

*Jerusalem Artichokes* are propagated by planting the smaller roots, or the larger ones cut into pieces with an eye or bud to each piece, either in the spring or autumn, at a good distance from each other, in almost any soil that is but tolerably deep. These roots will multiply greatly; and



and in the autumn following, when their stems decay, they may be taken up for use. It is best to set them in a remote corner of the garden, because they are very unsightly while growing, and their roots are apt to over-run every plant around them: nor is it easy to destroy them after they have once taken possession of the ground. The Jerusalem artichoke (*Helianthus*) is a species of the sun flower. It is a watery root, and very apt to engender wind; for which reason it is little esteemed.

*Leeks* are raised by sowing their seeds in the spring, in the same manner as onions, with which they are commonly mixed, and sown at the same time, in such proportion as is desired of either sort. The onions are by much the quickest growers: but if they are taken off the ground in July, as they generally are, the leeks will afterwards have sufficient time to grow large; so that there may, properly enough, be a moderate crop of each on the same ground: for their culture is exactly similar. I shall give the particulars of it in the article *Onions*; and only observe here, that some persons sow their leeks in beds in the spring; and in June, after some of their early crops are taken off, they dig up the ground on which they stood, and plant their leeks out there, in rows a foot asunder, and six inches from each other in the rows; observing to water them till they have taken root; after which they will require no farther culture, but keeping the ground free from weeds. This is a very good method for persons who have but little room: for the leeks thus planted will grow to an extraordinary size.

To save the seeds of this plant, which does not spindle till the second year, some of the finest and largest leeks, marked out for this purpose, must be let remain in the place where they grow until  
February,



February, when they should be transplanted in a row against a warm hedge, pale, or wall, at the distance of about eight inches asunder; and when their stems run up, they should be supported by a string stretched horizontally along them, to prevent their being broken down, to which they are very liable, especially when in head. The closer they are drawn to the fence, at the end of the summer, or in autumn, the better their seeds will ripen; which is of so much the greater consequence, as they sometimes do not perfect them in this country in cold summers or autumns, but are entirely spoiled by early frosts.

When the heads turn brown, which is a mark that the seeds are ripe, they should be cut off, with about a foot of the stalk to each, then tied in bundles of three or four heads, and hung up in a dry place, till Christmas or after, when the seeds may be threshed out for use. This, indeed, is not easy, on account of the toughness of their husks: but rubbing them hard against rough tiles will break those husks, and get the seeds out better than perhaps any other method.

*Onions* intended for the general winter crop should be sown in the latter end of February, or beginning of March, on rich light ground, well dug and levelled, and cleared from the roots of all weeds. The weather should be dry, and the surface of the ground not moist, at the time of sowing. The common allowance of seed is after the rate of six pounds to an acre of land: but the generality of gardeners sow more, in order to allow for drawing out a crop which they call cullings. However they ought not to be sown too thick.

The way of sowing these seeds alone in the garden is, to strew them as equally as possible over the ground intended for them, then to tread or beat it down flat, in order to fix them in their places,



places, and as soon as they begin to shoot, to sift a little fine earth over them, to the thickness of somewhat less than a finger's breadth: for they must not be buried deep.

In about six weeks from the time of sowing, the onions will be forward enough to be hoed. This should be done in dry weather, with a hoe about two inches and an half wide; carefully cutting up all weeds, and thinning the plants themselves till they stand at least two or three inches asunder. In about a month after, they must be hoed again, and thinned till they are four or five inches from each other; and in about a month or six weeks more, they must be hoed for the third and last time, and thinned to the distance of at least six inches. — If this hoeing (which may be performed with a wider hoe, for the sake of greater riddance,) be well executed, and the weather proves dry, the ground will remain clean till the onions are fit to pull up, which will generally be toward the middle of August. But if the season be wet, a careful person should go over the ground, about a fortnight or three weeks after this last hoeing, and pluck up by hand all weeds that may chance to have taken fresh root, or to have sprung up since the former clearing: for the onions should not be disturbed with a hoe after they have begun to bulb.

Onions have attained their full growth when their blades fall to the ground, and shrink: but before their necks are withered off, the bulbs should be taken up, and, after cutting off the extremity of their leaves, be spread upon a dry spot of ground, and there turned every other day at least, to accelerate their drying, and prevent their taking fresh root; which last they will otherwise quickly do, especially in moist weather. With this management, they will be fit to house in about a fortnight.



fortnight. But at the time of hoeing them, which should be done in perfectly dry weather, particular care should be taken to rub off all remaining earth, to separate the faulty roots, which would soon decay and spoil the rest; and not to lay them up in too thick heaps, lest this should make them sweat, and consequently rot. A loft, or garret, is therefore preferable to a lower room, or ground floor; for keeping them in; and the less they are exposed to the air, the better they will be preserved. It will be right here to look them over at least once a month, and to pick out all such as are found to be decaying: though, with all the care that can possibly be taken, many of them will sprout in the loft, especially in mild winters, which are generally moist, unless their roots have been slightly singed with a hot iron. This indeed, will effectually prevent their growing: but great caution must be used not to scorch the pulp of the onions; for that would soon destroy them.

To save the seeds of onions, some of the firmest, largest, and best shaped bulbs should be replanted, in the beginning of march, in well dug beds of fine good mould, about three feet wide, and two feet asunder. Each of these beds will consequently be wide enough to contain four rows of plants, at the distance of near a foot from each other. To make these rows, a channel, for each, should be opened all along the bed, to the depth of about six inches, and the onions intended for seed should be placed therein, with their roots downward, at about nine inches asunder. They should then be covered, by raking the ground smooth, and in about a month's time their leaves will appear. Many of these roots will produce three or four stalks. Care must be taken to keep them clear from weeds; and towards the beginning of June, when the heads of the flowers begin



to shew themselves upon the tops of the stalks, stakes, about four feet long, should be fixed in the ground, at such distances that strings may be fastened from one to t'other, so as to support those heads, which would otherwise soon be broken down by wind and rain, or even by their own weight. These strings should therefore run close under the heads that are to be supported by them.

About the end of August, the heads of the onions will turn brown, and the cells which contain the seeds will begin to open. This is a sure sign of their being ripe, and no time should then be lost to cut them, lest they should fall to the ground. The heads thus cut should be immediately spread upon coarse cloths, and exposed to the sun: but they should be sheltered at night, and also in wet weather. When they are quite dry, the seeds must be beaten out, which is very easily done, and after clearing them from their husks, &c. and exposing them again to the sun, for one day, to complete their drying, they may be put up in bags, and kept for use.

The Spanish onion is most esteemed for it's mildness as well as size; but it soon degenerates in this country. The next place is given to the Strasburgh, and the third to the white, sometimes called the Egyptian, which is the species that furnishes the general winter crop, of which only I have hitherto spoken. But the gardeners about London generally raise two other crops from this same sort. One of these crops, known by the name of Michaelmas onions, is sown in August, and supplies the markets after the winter onions are over: the other is sown in the spring, and is drawn up for sallets, after the Michaelmas onions are grown too large for that purpose.

For what concerns the Welch onion, or ciboule, the scallion, and cives, see the article *Salleting*.

The



The best full grown onions are, the largest, roundest, whitest, and thinnest skinned.

As a proof that the size of onions may be greatly increased by stirring the ground around them whilst they grow (for which purpose they must stand pretty far asunder), I cannot but mention here, what M. Duhamel relates<sup>s</sup> of one of his correspondents, M. Barbuat, M. D. who in the year 1755, having sowed onions in February, and accidentally neglected them till the middle of May, found them quite choaked with weeds. He ordered these weeds to be pulled up, and, contrary to the advice of all the gardeners near him, gave the ground in which his onions were, two deep stirrings. Most of them grew to four and four and an half inches in diameter.

*Parsneps* require a rich, mellow, and deep soil; in order that their roots, according to the bigness and length of which they are esteemed, may have full room to thicken and run downward. The seeds of these plants should be sown in February or March, either alone, or with carrots, especially if it be intended to draw these last very young; because parsneps seldom spread much before the latter end of summer, by which time the carrots will, in this case, be gone. The practice of those gardeners who sow leeks, onions, and lettuces with their parsneps, is very wrong; because so many different growths must impoverish one another.

The young parsneps must be hoed and weeded, or, if they were sown in rows, the ground between those rows must be dug, three or four times in the spring, or whenever else many weeds appear. By the latter end of the summer, their leaves will cover the ground, and prevent the farther growth



of weeds ; so that they will not require any more care after that season.

When their leaves begin to decay, their roots may be dug up for use : but they are seldom well tasted before that time ; nor are they good for much late in the spring, after they have shot out again. They, therefore, who would preserve them for spring use, should dig them up in the beginning of February, and bury them in sand in a dry place, where they will remain good until the middle of April, or later.

To save the seeds of this plant in the most advantageous way. Some of the longest, straightest, and largest roots, should be singled out, and planted about two feet asunder, in a place where they will be defended from the strong south and west winds : for the stems of the parsneps generally grow to a great height, and are very apt to be broken by strong gusts of wind, if they are exposed thereto. This ground should also be kept clear from weeds ; and if the season should prove dry, watering of these plants moderately, twice a week, will increase the quantity, and improve the quality, of their seeds, which will be ripe about the end of August or beginning of September, when the heads should be carefully cut off, and spread upon a coarse cloth for two or three days, to dry. The seeds should then be beaten off, and put up for use. But neither these, nor carrot seeds, should be depended on after they are above a year old.

*Potatoe.* The culture of this plant, which is in all respects fitter for the field, than for the garden, has been treated of so very fully in the preceding volume of this work, that I cannot do better than refer the reader to the directions there given ; especially as they are  
equally



equally applicable to the field, and to the kitchen garden <sup>h</sup>.

*Radishes* are sown in different seasons, according to the time when they are desired for use. Those sown in September will be fit to eat at Christmas, if they are not destroyed by frost : but they must be used whilst very young, for they soon grow hot and sticky. If sown towards the end of October, which is commonly the time of sowing for the earliest crops, they will be fit for the table in the beginning of March. Those sown at Christmas, if the season is mild, and the ground in good order, will, if they escape the frost, be fit for eating about the end of March or beginning of April ; and by continuing the sowing once a fortnight, from the middle of January till the beginning of April, always observing to sow the earliest crop in the warmest and best sheltered situations, and the later ones in a moist soil and open situation, without which they will run up, and grow sticky, before they are fit for use, a regular succession of these roots may be had throughout the season. The tenderest, and mildest to the taste, are those which have been raised in deep, rich, and light mould.

When the radishes are come up, and have got five or six leaves, they must be thinned wherever they stand too close ; for otherwise they will run up in tops, and not increase in their roots. Some thin them by hand : but it is much better to use a small hoe, which will stir the ground, destroy the weeds, and promote the growth of the young plants. They may be left about three inches asunder, if they are intended for drawing up small ; but six inches will be little enough, if they are to stand till they are pretty large.

The kitchen gardeners about London, who pay great prices for their ground, and therefore are

<sup>h</sup> See Vol. III. p. 182—191.

obliged to make it produce as many crops as possible in the year, sow carrot seed with their early radishes, in order that if the radishes are killed soon after their coming up, as they sometimes are, the carrots may remain, for the seeds of these last generally lie in the ground five or six weeks before they grow, while those of the radishes sprout in about a fortnight: but when both crops succeed, the radishes must be pulled up while very young; or they will weaken the carrots so that these last will not be able to support themselves after the former are gone.

It is also the constant practice of these industrious and intelligent men, to sow spinage with their latter crop of radishes: for after the radishes are taken off, and the ground has been cleared between the plants of spinage, these last will grow so prodigiously as to cover the whole space in a fortnight's time: and if this spinage is of the broad leaved kind, it will be larger and fairer than it usually is when sown alone; because most people are apt to sow it too thick, when they do not mix it with any other crop.

The small topped, the deep red, the scarlet, and the long topped striped radish, are the varieties generally cultivated in kitchen gardens. The small topped is most commonly preferred, because it takes up the least room: but a small spot of ground will furnish, from each sowing, as many radishes of any kind as can be spent in a family while they are good.

The Naples radish, which has a very white, round, small, and sweet root, may be propagated in the same manner as the common sort, excepting that it should not be sown till the beginning of March, and the plants should be allowed a greater distance. It is not very common in this country; and, indeed, its seeds are apt to degenerate here.

The



The white and the black Spanish radishes will be fit for the table by the end of August, or the beginning of September, if they are sown about the middle of July, or a little earlier, and will continue good till the frost spoils them. These should be thinned to a much greater distance than any other sort: for their roots will grow as big as common turneps. If they are drawn out of the ground before a hard frost comes on, and laid up in dry sand, in the same manner as is practised for carrots, they will keep good all the winter.

To save the seeds of radishes, some of the straightest and best coloured roots should be planted in rows three feet asunder, and at the distance of two feet from each other in the rows, in deep and well dug ground. If the season is dry, they must be watered from time to time till they have taken root, after which they require no farther care but keeping them clear from weeds; nor need these be feared after the branching seed-stalks of the radishes have over-spread the ground, as they will soon do, in such manner as to prevent their farther growth.

In this transplanting of the radishes, an allowance should always be made for bad seasons; because the very same plants will not yield a fourth part of the quantity of seeds in dry seasons, that they would do in a moist season.

When the seed begins to ripen, it should be carefully guarded from birds; and when it is ripe (which is known by the pods turning brown), it should be cut, dried in the sun, threshed out, and laid up in a place where mice cannot come at it.

*Rocambole* is cultivated in the same manner as garlick, of which it is a species. The only difference between them is, that besides the cloves of which it's root consists, it bears at the top of it's stem a head composed of many small bulbs, about



as big as large peas, and these, which are it's seeds, are the part used in the kitchen. It is propagated either from them, or by parting it's roots. These heads should be kept dry after they are gathered.

*Scorzonera*, commonly called viper's grass, should be sown about half an inch deep, in light ground. The best time for this sowing is the beginning of April; and the best method, in rows sufficiently distant to leave room for digging the earth between them: for this will greatly increase the bulk of the roots, for which only scorzoneras are cultivated. These roots are of the tap kind, about the thickness of a man's finger, brown without, white within, and full of a milky juice. They are accounted very wholesome, nourishing, and much more delicate than either parsneps or skirrets.

When the plants are come up, they should be thinned to the distance of at least six inches from each other in the rows, and kept clear from weeds by hoeings repeated as often as may be necessary. Their roots may be taken up when the leaves begin to decay, for they have then done growing, and these may be preserved all the winter in dry sand: or they may be left in the ground till spring, and dug up as they are wanted: but those which remain in the earth after February, will shoot up their flower-stems, and become strong and sticky.

Sowing them in drills is far preferable to the common practice of sowing them in broad cast, and afterwards transplanting them into rows; because, if their roots are broken, they never after grow strait, or long, but shoot out into many forked small roots, unfit for use.

To save the seeds of these plants, some of the fairest should be let remain where they were sown. They will flower in June of the second year; and  
when



when the stems are grown to their height, they should be supported with stakes, to prevent their breaking, or falling to the ground. Their seeds ripen about the beginning of August.

*Skirrets*, which are a kind of parsnep, thrive best in a light and moist soil. They are propagated either by seeds, or by slips from the root, which is composed of several fleshy fibres, about the thickness of a man's little finger, terminating in one head. This root, for which only the skirret is cultivated, is reckoned wholesome and nourishing: but it is flatulent, and too sweet tasted for many palates. The seeds of this plant, which generally produce larger roots than the slips, should be sown about the end of March or the beginning of April, and if they are good, the plants will appear in five or six weeks. When they have put out their leaves so as to be well distinguished from weeds, the ground should be carefully hoed; and this should be repeated three several times, in the same manner as is practised for carrots. In these hoeings, which should be performed in as dry weather as possible, the better to destroy the weeds, the skirrets, whether sown in broad cast, or in drills, should be thinned to the distance of at least three inches from each other. In autumn, when the leaves begin to decay, the roots will be fit for use. These may be preserved all the winter, and till they begin to shoot in the spring, when they will become hard and sticky. So will also those which run up to seed the first summer, and which should therefore be pulled up and thrown away.

The season for propagating skirrets by offsets is in the spring, before they begin to shoot. The old roots should be dug up then, and the side roots should be slipped off with an eye or bud to each. These should be planted four inches asunder,  
in

in rows sufficiently distant to leave room for digging between them.

*Turneps* have been so fully treated of in my third volume<sup>i</sup>, and their culture in the field may be so easily applied to the kitchen garden, that I have nothing to add here, unless it be, that the French turnep, which must be used young, is so small that it is boiled whole in soups, and is much esteemed for that purpose in foreign countries; that the long-rooted turnep, which must also be used whilst it is very young, will grow to as great a length as the parsnep, but is apt to be extremely rank; that the yellow turnep has yellow flesh, as well as a yellow rind; that the young tops of this plant are sometimes eaten by country people, instead of sprouts; and that if the turneps which are intended for seed are transplanted, they should be removed in February, and set at least two feet asunder every way. The ground must be kept clear from weeds until the turneps have spread so as to keep them under. When the seed is near ripe, care must be taken to defend it from birds, which is best done by laying bird-limed twigs upon the seed branches of the turneps; for some of those winged pilferers will be caught thereby, and if they are permitted to remain entangled there for some time, and afterwards turned loose, they will for a while prevent others from coming to that place. When the seed is ripe, it should be cut down, dried in the sun, threshed out, and laid by for use.

<sup>i</sup> Page 149——173.



## A R T I C L E II.

*Plants cultivated in the Kitchen Garden for their young shoots, their leaves, or their heads.*

**A**R T I C H O K E S require a rich, deep, and moist soil, thoroughly dug several times over, and mixed with plenty of well rotted dung, to the depth of at least three feet: for the deeper the mould is, the less watering they will require in the summer, and the larger and better flavoured their fruit will be in autumn. They may be raised from seeds; but the usual and most expeditious way of propagating them is by slips, or suckers, taken from the old roots in February or March, or as soon as the hard frosts are over. These suckers should be taken off with some fibres to them; and if they are planted in a well prepared soil, like the above-mentioned, they will yield fine fruit the next autumn.

The time for taking off these suckers, is also the proper season for dressing the old stocks; which is performed thus. After all the earth has been removed from about the stock, down to below the part from which the young shoots are produced, two, or at most three, of the clearest, straightest, and most promising of these shoots, issuing from the under part of the stock, are chosen for a crop. These are far preferable to the strong thick shoots that generally spring up from the crown of the roots, with woody stems which never produce good or regularly scaled fruit. The gardener then (having previously taken off the suckers intended for planting elsewhere, in doing of which care must be taken not to injure the plants intended to remain) forces off, with his thumb, all the other buds and  
young

young shoots, close up to the head of the stock; separates the young plants that are left, as far asunder as he can without breaking them; draws the earth up to them with a spade; presses it down close around them with his hands; and then pulls off the tops of the leaves which hang down.

Some, when they give this dressing, dig their ground all over, and are well rewarded for their pains by the extraordinary fineness of their fruit.

When this is done, and the ground laid level, a crop of spinage may be sowed between the stocks; for it will be gathered before the artichokes can cover the ground.

Toward the end of April, or beginning of May, when the plants begin to fruit, all the young shoots produced from their roots or stems since the dressing must be pulled up or cut off, so as to leave only the principal head, which will by that means bear a fine large fruit. When the artichokes are fit to gather, their stems must be cut down close to the ground, in order that the stocks may make strong fresh shoots before the end of October, which is the usual season for earthing them up, or, as the gardeners term it, landing them: though this may be deferred till any time in December, if the weather proves mild.

This earthing of them consists in, cutting off all the young shoots quite close to the ground, then digging a trench between each row, and covering the stocks with the earth thrown up, in such manner that they may be, as nearly as possible, under the middle of the ridge. This will secure them from any common frost, and is infinitely better than the usual practice of covering them with long dung, which never fails to render their fruit small and very thin bottomed; for nothing is more prejudicial to this plant, than the burying of new dung near it's roots, or laying it about them; so  
great



great is the danger of it's making them rot, and of it's harbouring vermin which will destroy them. If, indeed, hard frosts are apprehended, a quantity of long dung, peas haulm, tanner's bark, or any other light covering, may be laid over the ridges; because it will there be at such a distance as not to injure the roots. This covering should not be laid on till there is no avoiding it; and it should be carefully taken off as soon as the weather is mild; for the plants will certainly be injured if it lies too long upon them.

The plants thus earthed up will not require any farther care before the end of February, or beginning of March, by which time they will have grown through the ridge of mould; and this, if the weather be proper, is the season for dressing their roots as before directed.

Though the stocks of artichokes will last ten, or even fifteen, years in a rich and deep soil; yet, as they are great impoverishers of the ground, their fruit will dwindle so as to render it most adviseable to renew the whole plantation every fourth or fifth year, or, perhaps, rather every second or third: to this end, the ground being prepared, and provision made of a sufficient number of suckers chosen in the manner before directed, that is to say, clear, sound, furnished with fibres, and not woody; the gardener should pare off the knotted part which joined to the stalk. If it cuts crisp and tender, the sucker is good; but if it be tough and stringy, the shoot is not worth planting. Having thus singled out those that are fittest for his purpose, he should cut off their large outside leaves pretty low, in such manner that the middle, or heart, leaves may rise above them. After this, if the weather be very dry, or the plants have been long taken from the stocks, it will be right to set their root-ends, at least, in a tub of water, for three or four hours,



to refresh them, before they are planted. The best method of planting them is in rows as strait as possible, and at the distance of two feet from each other in the row. If there be more rows than one, as generally is the case where a full crop is wanted, these should be five feet asunder, and the plants should be set quincunx fashion. They should be planted about four inches deep, the earth should be closed very fast to their roots, and, if the season proves dry, they should be watered twice or thrice a week, till they have taken good root. In a favourable season, or on a moist soil, these plants will produce the largest and best artichokes in August and September, after all the old stocks have ceased to bear: so that a doubly long continuance of this fruit may be had, by making a new plantation every year.

A thin crop of spinage may be sown upon this ground before the plants are set: but none of it must be suffered to grow very near them.

If any of the artichokes thus planted in the spring should not produce fruit in the autumn, they may be made to yield it in the winter, or early the next spring, by tying up their leaves at the time of earthing up their roots, heaping up mould around till only their tops are seen, and then covering those tops with a little straw, or peas haulm, to defend them from frost.

The kitchen gardeners near London, who endeavour to make the most of every inch of their high-rated land, generally plant their rows of artichokes nine or ten feet asunder; and besides sowing between them radishes or spinage, they plant two rows of colliflowers, at the distance of two feet and an half from each other in the rows, and of four feet from row to row; so that full five feet are allowed for the artichokes. In May, when the crop of radishes or spinage is taken off, they sow  
along



along the middle of the space between the two rows of colliflowers, a row of cucumbers, for pickling, at the distance of every three feet; and between the colliflowers and the artichokes they plant, for winter use, a row of cabbages or savoy, which have room enough to grow after the colliflowers and artichokes are taken off. Thus the ground is fully cropped during the whole season.

If the artichoke stocks shoot but weakly in the spring, as they will do if they have been hurt by frost or too much wet; the best way is to uncover them with a spade, to loosen and break the mould around them, or rather to dig the whole ground, if it be not planted with any thing else, and then to earth up a little the plants of each stock. In three weeks or a month's time after this, the slips will be fit to take off.

A moist rich soil always yields the largest and best artichokes: but if it be very moist, the roots will not live through the winter. Such ground should therefore be allotted for fresh plantations made every spring, to supply the table in autumn, after the old stocks have done bearing: and for early fruit, the plants should be in a drier situation. It should also be open, and at a distance from the dripping of trees: for they would draw the plants up in height, and thereby render their fruit poor and small.

The two sorts of artichoke commonly cultivated in this country are the *globe* and the *French*. The former, which has by far the most fleshy leaves, the thickest bottom, and the best taste, is deservedly preferred. It is also the largest. The scales of this sort are brown, and turn inward. The French artichoke is more conical, it's scales are narrower, of a greener colour, and frequently turned outward, and it has a disagreeable perfumed flavour.



In Italy and France they cultivate a small red artichoke, which is eaten raw with pepper, salt, oil, and vinegar<sup>k</sup>.

There are people who blanch the stalks of artichokes in autumn, and eat their pith, either raw or boiled. Chards of artichokes, otherwise called custons, are the leaves of artichokes tied up, wrapped round with straw in autumn and winter, and covered all over, except at top. This makes them turn white, and takes off a little of their bitterness. When boiled, they are served up as Spanish cardoons: but they are wretched eating. Besides, the plants on which these tricks are played, often rot and perish during the time of whitening this trash<sup>l</sup>.

The bottoms of artichokes are good for many culinary uses. The way to preserve them all the winter is, to separate them from the leaves, par-boil them, and hang them up in a dry place, strung on packthread, with a clean piece of paper between every bottom, to prevent their touching one another. Notable country housewives recommend them likewise pickled.

Besides hard weather, and excess of wet, artichokes have also an enemy in field mice, which are fond of their roots, if they can come at them.

M. de Chateauvieux has raised most excellent artichokes in the open field, without dunging the ground at all, or even watering the plants; but solely by a judicious execution of the principles of the new husbandry: so great are the benefits which accrue from a thorough stirring of the earth! Artichokes which he planted at the end of May, produced in September their first fruits, which were, in general, from twelve to fifteen inches in circum-

<sup>k</sup> *Maison Rustique*, Tom. II. p. 98.

<sup>l</sup> MORTIMER'S *Art of Husbandry*, Vol. II. p. 139.



ference\*. Their leaves covered entirely beds six feet wide, in which they were planted<sup>m</sup>.

This renders it highly probable, that if artichokes were always planted in single rows, and in beds, by which means the ground between them may be the more easily and more frequently stirred, they would thrive better than in the common way of setting them in quincunx, or any other form, in ground laid out in one continued flat. The gardeners about great cities will not be easily brought into this method, nor indeed can they well afford it, because they would hereby lose some of their crops. But as this part of my work is designed chiefly for persons who are not professed gardeners, and whose garden is intended only for their own private use; I think it incumbent on me to point out the best way of raising each plant in it's greatest perfection, without restricting myself to the consideration of it's increase only. Yet even here, though lasting plants will not be proper among the artichokes, many others which stand but a short time, such as young fallowing, spinage, &c. may be cultivated with propriety.

*Asparagus* is propagated by seeds, and cultivated in the following manner.

Let a sufficient number of the fairest, largest, closest, and roundest buds be chosen in a good asparagus bed, and there marked out by a stake thrust down close to each of them; but in such manner as not to injure the crown of the root. These stakes will serve, both to distinguish them from other plants, when numbers are run up, and to fasten them to when their height and lateral

\* If these were of the green, or conic sort, which we call French archtichokes, as it is highly probable they were; this size is the more surprizing, as that species never spreads near so much as our globe artichoke.

<sup>m</sup> DUHAMEL, *Culture des Terres*, Tom. IV. p. 455.



branches might otherwise endanger their being broken down by wind. Their berries will be ripe about the end of September, when their stalks should be cut down, and the berries stripped off into a tub, where they should remain three weeks, or a month, to sweat. Their outer husk will by that time be rotted. The tub should then be filled with water, and a man should break all the husks by squeezing them between his hands. The husks thus broken will swim upon the surface, and the seeds will sink to the bottom of the water, which, being poured off gently, will carry off the former along with it. The remaining seeds will be entirely cleansed by stirring them about in two or three fresh waters, and pouring off the water as soon as they are settled. They should then be spread upon a mat or cloth, and exposed to the sun and air in dry weather, till all their moisture is exhaled: after which they should be kept in a dry place till the beginning of February, when it will be time to sow them.

The manner of sowing them is, to strew them on a well dug and very level bed of rich earth, which must afterwards be trodden all over, to bury them, and then raked smooth. Too thick sowing would be productive of only small plants.

The only care requisite during the next summer, is to keep these plants clear from weeds; and towards the latter end of October, when their haulm is quite withered, the thickness of about an inch of rotten dung may be spread over the surface of the ground, as well to enrich it, as to shelter the young buds from the winter's frosts.

The following spring will be the fittest time for transplanting these asparagus: for it has been remarked by experienced gardeners, that they take best, and produce the finest roots, when they are but one year old. The ground into which they  
are



are to be transplanted should be prepared a little while, but not long, before hand, by trenching it well, and burying at the bottom of each trench a good quantity of rotten dung, which must be covered with at least six inches depth of fine mould. If the soil is dry, and the season forward, this transplanting may be performed about the end of March; but for very moist ground, it is better to stay till the middle of April, about which time the plants generally begin to shoot. Those who advise Michaelmas for this work, are wrong: for not one in five of these plants removed then will ever prosper.

The roots which are to be transplanted must be carefully taken up with a narrow pronged dung-fork, and not dug up with a spade, for fear of cutting them; the earth about them must be shaken off; they must be separated from each other; and if they are laid even, with their heads uppermost, as they are to be planted, this precaution will be a means of saving some time and trouble. After this, the plot of ground being levelled, a line must be stretched very tight along one side of it, to direct the opening of a trench exactly strait, and about six inches deep; which will consequently reach very near to the surface of the dung underneath: but care must be taken not actually to turn up any of that dung. The transplanted roots are to be placed upright against the bank of this trench, with their fibres well extended (which the gardener will help with his fingers), and their buds standing forward, so as to be about two inches below the surface of the ground, with which the trench is then to be filled up, raking it smooth. The distance from plant to plant, in the trench, should be twelve inches; and when four parallel rows, a foot asunder, have been planted in this manner, they will form a sufficiently wide



bed, between which and the next a space of two feet and an half should be left, for an alley to go between them to cut the asparagus, and do other necessary works.

A small crop of onions may be sown upon this ground immediately after it's having been thus planted: for the treading of their seeds, and raking them over, will not hurt the asparagus.

When the asparagus and onions are come up, which will be in about a month or six weeks after the time of planting, they must be well weeded with a small hoe, and these last must be carefully thinned, especially around the young shoots of asparagus. About three repetitions of this work, if it be well done, and in dry weather, will keep the ground clear from weeds till the onions are fit to be pulled up, which generally is in August; and one thorough clearing after they are gone will suffice till October, when the haulm of the asparagus will begin to wither, and the beds are to be earthed up. Care must be taken not to cut off this haulm whilst it is at all green, lest the roots should shoot out again, which would weaken them greatly: and when it is cut (which should always be done with a sharp knife), it's stems should be left two or three inches above ground, as marks whereby to distinguish the beds from the alleys. The beds should then receive another hoeing, and all the weeds and rubbish raked off from them should be buried in the bottom of the alleys, which are now to be dug up, and the earth taken out of them thrown upon the beds, so as to raise these about five inches above the alleys. A row of coleworts (but not beans, as is the injudicious practice of many who do not consider that the roots of these spread so wide as greatly to damage the two outside rows of asparagus) may then be planted in the middle of the alleys: but nothing  
should



should, from this time, be sown or planted upon the beds, which are to remain untouched till the ensuing spring. They must be hoed over, raked smooth, and kept clear from weeds during the following summer; and, in October, the alleys are to be dug up again, and the beds earthed as before.

In the second spring after planting, the beds must be forked up with a flat pronged fork, commonly called an asparagus fork, which is made on purpose for this use. This should be done about the end of March, before the buds begin to shoot, and with great care not to bruise the head of the root by forking too deep; and, a little while after this, the beds must be raked smooth, just before the buds appear above ground: for by thus deferring to rake, and letting the ground lie somewhat rough, for a short time, the mould will be more mellowed, all young weeds will be more effectually destroyed, and the beds will remain clean much longer than if the raking were totally omitted, or performed immediately after the forking.

Some asparagus may be cut in this second spring after planting: but it will be much better to wait till the third. However, if curiosity does prevail, let a few, and only a few, of the largest buds be taken after they are about four or five inches high, and let all the rest run up to strengthen the roots: for though the quantity of shoots will be increased by the cutting of a greater number of heads, they will at the same time be so much the smaller, and the roots will decay the sooner.

The right way to cut asparagus is, to open the ground around the head intended to be gathered, with a very narrow and long bladed knife, filled with teeth like a saw, in order to see whether any other young buds are coming up close by it. If there



are, it will then be easy to avoid hurting them : but without this precaution, that mischief cannot well be shunned ; as the heads of asparagus should, generally, be cut, or rather sawed off, about three inches underground. People who are used to this business will do a great deal of it in a short time, though it may seem tedious and troublesome to others : but the caution here given is absolutely necessary to be observed by all who cut asparagus.

The dressing of the asparagus-beds is every year the same as here directed for the second, namely, clearing them from weeds by repeated hoeings at the proper seasons, digging the alleys and earthing up the beds in October, and forking the beds toward the end of March ; with the addition of this farther circumstance, that it will be proper every other year to lay some well rotted dung (taken from a melon or cucumber bed) all over the beds of asparagus, and likewise to bury some of it in the alleys, when they are dug up. This will keep the ground in such heart, and the roots in such vigour, that a plot of good asparagus will yield fine heads during ten or twelve successive years, if it be not cut too long each season : for unless these plants are suffered to run up pretty early in June, their roots will be greatly weakened, and their shoots will be so much the smaller. For this reason, where asparagus is required late in the season, it is much better to set a few beds for that purpose, than to injure a whole plantation by cutting it too long.

The way to raise asparagus from their seeds is, after the ground has been well trenched, dunged, and levelled, to prick holes in it, not above half an inch deep, and about a foot asunder, and to drop into each of these two seeds, lest one should miscarry. They are, of course, easily covered over as soon as sown. These holes should be in strait

rows,



rows, directed by a line stretched across the ground; their distance from each other should be one foot, and a space for an alley between the beds should be left after every fourth row, if these plants are intended to stand for cutting in the place where they have been sown; which, says the most celebrated gardener of this age<sup>n</sup>, “is a very good method”, because, “as the roots of asparagus always send forth many long fibres which run deep into the ground; so, when the seeds are sown where they are to remain, these roots will not be broken or injured, as those must be which are transplanted: therefore they will shoot deeper into the ground, and make much greater progress, and the fibres will push out on every side.” — But, with Mr. Miller’s leave, the very argument which he alledges here in favour of the practice of those who do not remove their asparagus from the place of it’s first growth, is, to me, who love to be guided by facts, rather than by mere speculation, the strongest reason that can be for transplanting it: numbers of absolutely decisive experiments, several of which have been related in the course of this work, having proved, beyond all doubt, that fibrous rooted plants of every kind are, without exception, signally benefited, instead of being hurt, by taking off the extremities of their roots, which never fail, in lieu of them, to put forth an increase of new fibres, whereby the plant is supplied with food more plentifully than before. All M. Duhamel’s experiments, all those of his correspondents, and all those, in particular, of the very accurate and judicious M. de Chateauvieux, and, before them, those of our own countryman, Mr. Tull, evince the truth of this indisputable fact. Even tap-rooted

<sup>n</sup> MILLER’S *Gardener’s Dict.* Art. ASPARAGUS.



plants are, in this respect, equally benefited by cutting off the end of that long root; because the so doing makes them strike out numbers of new horizontal roots and fibres, which convey a so much greater quantity of food to the plant. We have a striking instance of this in the lucerne transplanted by M. de Chateauvieux<sup>o</sup>: and even Mr. Miller himself, when he speaks as a flower gardener, (in which his long and extensive practice has afforded him uncommon room to excel,) very frequently advises cutting off the extremities of the roots of flowers, in order to make their heads thrive the better, by an increase of fibres which those very roots will then put forth. The only reason for not cutting off the tip of the tap-root of such plants as carrots, parsneps, &c. which are cultivated for that root alone, is, not that it would stint the growth of their heads, for the contrary is known to be the case; but because it would stop the perpendicular growth of their roots, and make them strike out side-ways, in numbers of new roots and fibres, which would convey additional food and strength to their shoots above ground, where, for them, it is not wanted. But, as the design in cultivating asparagus is to make them produce as many large heads, or buds, as possible; I cannot conceive how this author could thus forget himself, or why asparagus alone should here be an exception to the general, and well known, laws of nature. — I was going to say, that 'tis pity this gentleman did not attend more carefully than he seems to have done, to the vast improvements lately made in agriculture, before he promised, in the title page of his dictionary, (the merit of which I am far from meaning to depreciate in any shape, in what relates immedi-

<sup>o</sup> See *Vol. III. p. 260 and 263.*



ately to his knowledge as a botanist,) to give the best and newest methods of performing the practical parts of husbandry. Had he but read attentively, and considered well, the unvaried tendency and result of the many interesting experiments clearly recorded in M. Duhamel's Treatise on the Culture of Land, he would most certainly have altered and improved several articles in the late edition of the abridgment of his dictionary, and thereby have rendered it an excellent work; a work, for which the public would then have been doubly obliged to him.

He may, indeed, be partly very right in the reason which he assigns for letting the asparagus raised from seeds remain where they were first sown, if it be right to have four rows of them in one bed; because, as the two middle ones cannot then receive any benefit from the culture bestowed on the alleys, they will stand in need of every advantage that can be derived from the greatest depth of good ground to which their roots can penetrate. But, for the same reason that it must be of service to asparagus, as it is signally to all other of the many rooted plants, to have an increased number of mouths whereby to imbibe their food; it seems more than probable, that these also would thrive best, and consequently produce the largest heads, if only two rows of them were planted a foot asunder in a bed two feet wide, with an alley of nearly the same breadth on each side. This will be a sufficient space for stirring, or digging, the earth between the beds, and each of the rows of asparagus would consequently receive therefrom the same remarkable benefits as we see accrue to all other plants that are cultivated in this manner. The size of the heads thus raised would perhaps fully compensate for the extraordinary quantity of ground here required.

We



We have seen how amazingly the plants of wheat cultivated in the new way are benefited by the first stirring of the alleys in the spring, at which time it is a rule to bring the horse-hoe as near to the plants as can be without actually tearing them up. May we not, from a parity of reason, naturally conclude, that stirring the ground as near to the rows of asparagus as experience shall shew may be done with safety, will be attended with an equal advantage?

That asparagus are very greatly benefited by that frequent deep stirring of the earth in which the excellence of the new husbandry consists, has been demonstrated by M. de Chateauvieux, who, on the 24th of March 1753, planted in a bed two hundred feet long, and six feet wide (prepared only by repeated thorough plowing, without the least help of dung, or of any other manure,) a row of asparagus, which made good shoots that very year<sup>p</sup>. In the next, which was but their second, they were as fine as any in the best cultivated gardens<sup>q</sup>: and in the third and fourth, they were larger, better tasted, and in every respect finer, than those of his kitchen garden<sup>r</sup>.

The important circumstance which M. de Chateauvieux mentions expressly here, and which he and all good husbandmen who have given the new husbandry a fair trial, particularly for the culture of pulse and pot herbs, have constantly experienced, *viz*; that they are *better tasted* than any that are raised in the common way, makes me quite at a loss to understand Mr. Miller, when he says<sup>s</sup>;

<sup>p</sup> DUHAMEL, *Culture des Terres*, Tom. III. p. 168.

<sup>q</sup> *Id. ibid.* Tom. IV. p. 455.

<sup>r</sup> *Id. ibid.* Tom. V. p. 544.

<sup>s</sup> *Gardener's Dict.* ART. ASPARAGUS.



“ I cannot help taking notice of a common  
 “ error which has long prevailed with most people,  
 “ which is, that of not dunging the ground for  
 “ asparagus, believing that the dung communi-  
 “ cates a strong taste to the asparagus ; which is a  
 “ great mistake, for the sweetest asparagus is that  
 “ which grows upon the richest ground, and poor  
 “ ground occasions that rank taste, so often com-  
 “ plained of; the sweetness of asparagus being  
 “ occasioned by the quickness of it’s growth, which  
 “ is always proportionable to the goodness of the  
 “ ground, and the warmth of the season : but in  
 “ order to prove this, I planted two beds of aspa-  
 “ ragus, upon ground which had dung laid a foot  
 “ thick; and these beds were every year dunged ex-  
 “ tremely thick, and the asparagus produced from  
 “ these beds was much sweeter than any I could  
 “ procure, though they were boiled together in  
 “ the same water.”

It is allowed, that the sweetest asparagus is that  
 which grows upon the richest ground; and it is  
 very probable that the quickness of it’s growth,  
 which is perhaps always, or at least generally, pro-  
 portioned to the goodness of the soil and the  
 warmth of the season, does greatly contribute to  
 that sweetness : though it may, not irrationally,  
 be much doubted, whether the bare quickness of  
 it’s growth is the sole cause thereof, as Mr. Miller  
 seems to assert, or whether that desirable quality  
 in asparagus is not more immediately derived from  
 the soil itself.— But, in the name of all good hus-  
 bandry, is there no ground rich, ay very rich, with-  
 out it’s being stuffed with dung ? Is there no such  
 thing as a naturally rich, very rich soil ? Are there  
 no other manures than dung ? Is there not a way  
 to render soils very rich by a due mixture of earths  
 only ? And have not the late admirable improve-  
 ments, upon Mr. Tull’s plan demonstrated that, as  
 Mr:



Mr. Evelyn long ago rightly asserted, even the most barren soil may be rendered very fertile by proper culture alone? Have we not an irrefragable proof of this in the piece of absolutely clay which the truly intelligent M. de Chateauvieux brought to such a state, merely by frequent digging, as to enable it to bear as large and as fine plants of wheat, as any that his garden could have produced?

The kitchen gardeners about London, who live by selling the produce of their high-rented grounds, are indeed, in some measure, forced to use a great deal of dung, in order to have either very early, or very many crops, or both; and the motive which compels them to it, pleads their excuse for so doing: but it surely ought not to be the practice of gentlemen, or of those whose gardens are cultivated only for the use of their own tables; for, whatever Mr. Miller may say, either all the garden stuff that is raised around this metropolis, by the trading kitchen gardeners, who bring it here to market, does taste abominably strong of dung, or half the people in and about this city have, as well as myself, entirely lost the faculty of distinguishing one relish from another.

It may be true, though I do not know it to be so, that poor ground gives asparagus a rank taste: but certainly it does not give it *that* rank taste which is so much and so justly complained of, as being the effect of dung: for poor ground, if any one should be so very thoughtless as to plant asparagus in it, will never produce such large heads as we frequently see upon the tables in London, and which, notwithstanding their seeming fineness to the eye, often are even nauseously rank.

<sup>1</sup> See Vol. I. p. 269.



## THE KITCHEN GARDEN. 6r

As to the latter part of the above quotation from Mr. Miller, I confess myself so ignorant as not to be able to conceive that it proves any thing whatever. "To prove this" (*viz.* that it is not dung, but the poorness of the ground, which occasions the rank taste so often complained of in asparagus), "I planted", says he, "two beds of asparagus upon" (we will suppose *in*) "ground which had dung laid a foot thick; and these beds were every year dunged extremely thick, and the asparagus produced from these beds was much sweeter than any I could procure, though they were boiled together in the same water." — Should we not have been told from what kind of soil the other asparagus, by which this comparison was to be made, were taken? It may have been from even yet more thickly dunged ground, for aught we know, or are informed, to the contrary. — But I will suppose them to have been produced by undunged ground. — Still, is not the boiling of both sorts *together* in the same water, a strange way of making the comparison? M. de Chateauvieux, M. Duhamel, or any other person used to make accurate experiments, would surely have boiled each sort in a separate vessel, during an equal space of time, and over an equal degree of heat, as well as in the same sort of water. For want of this necessary explanation concerning the different growths of the asparagus, and for want of these other equally necessary precautions, I really do not see that this experiment of Mr. Miller is at all conclusive, or even that it conveys any clear and apposite meaning. — M. de Chateauvieux's is decisive: for his asparagus, raised in the field, without any dung at all, "were always" (during the four years of his relating this experiment) "larger, *better tasted*, and in every other respect finer, than those of his kitchen garden." — This



— This is speaking clearly, and to the point; as every one should do, who has indisputable facts to go by.

The forcing, as 'tis called, of asparagus, in order to have it earlier than the natural season, (and by the same means of hot-beds it may also be had later, and indeed all the year round,) is a great trade with the kitchen gardeners near London: but as it cannot be worth the private gentleman's, or the farmer's, while to be at that trouble and expence, I shall here pass over that unnecessary part of gardening.

— *Beet (white)* is cultivated for it's leaves only, which are frequently used in the kitchen, for soups, &c. The green beet, and the Swiss or chard beet, are only varieties of this species, which should be sown in the beginning of March, without any mixture of other crops, upon an open, and not over moist, spot of ground. Three hoeings, as before directed for red beets in the garden<sup>u</sup>, are also requisite here; and at the last thinning, the plants of the white, or the green, sort should not be left nearer than eight or ten inches asunder, if regard be paid to the goodness of their leaves. The Swiss kind, which has larger leaves, should have a few inches more room allowed it. When the leaves are fit for use, as they will be pretty early in June, the outer ones should be gathered first, in order to leave the others time to increase. By this means a small spot of ground will yield a sufficiency for a middling family, and furnish a constant succession of leaves during the whole year, if the plants are not suffered to run up to seed; for then their leaves cease to be good.

The chards as they are called, of this sort of beet, are the white, thick, and downy main shoot



produced in the middle of their tops, by covering them during the winter with long dry dung, as some do their artichokes. When this is practised, the plants are uncovered in April, and the earth is then dressed carefully about them.

The seeds of the white beet ripen somewhat earlier than those of the red. The manner of obtaining, gathering, and keeping them, is the same for both.

*Borecole*, is of three sorts, namely, the common borecole, the green borecole, and the Siberian borecole, which is the curled colewort, by some called Scotch kale. All these are for winter use; but the last is most esteemed. The two former are sown about the middle of April, and are fit for transplanting in about two months after. When this is done, the plants of either of these sorts should be set a foot asunder in rows two feet distant from each other. They should not be eaten before the frost has rendered them tender; for till then they are tough and bitter. The Siberian borecole, which is extremely hardy, never injured by cold, and always sweeter in severe winters, than in mild ones, need not be sown till the beginning of July, and when it's plants are strong enough for removing, that is to say, when they have about six or eight leaves, they should likewise be set in rows. The distance of a foot and an half, or, perhaps, rather two feet again, between the rows, and of ten inches between the plants in the rows, may be sufficient here. These will be fit for use soon after Christmas, and continue good till April. The soil for borecole should be a good, fresh, deep loosened earth. The manner of sowing, transplanting, and cultivating of it, is the same as for cabbage, like which the new set plants of borecole should be watered every other evening till they have taken fresh root. The common way is then to draw the  
earth



earth up around their stems with a hoe, to keep the ground moist about them, and thereby strengthen the plants : but good digging, deep hoeing, and frequent stirring of the earth between them, according to the principles of the new husbandry, will answer all these ends much better, and make the plants prosper greatly more.

*Brocoli* requires a good and pretty deep soil, rather light than otherwise. The proper time for sowing it is from the latter end of April to the beginning of June ; and the manner, the same as for cabbage. When the plants are about a fortnight or three weeks old, that is to say, when they have got seven or eight leaves, they should, like all others of the cabbage kind, be transplanted into beds of well prepared mould, and toward the end of July they will be fit to replant where they are to remain. This should be in a well sheltered spot, but not under the drip of trees. The plants should here be set in rows at least two feet asunder (but two feet and an half, or even three feet, will be yet better), and at the distance of a foot and an half, or rather two feet, from each other in the rows. Towards the end of December, if the weather is not very severe, they will begin to shew their small heads, which, especially at their first appearance, are not unlike to colliflowers. These heads should be cut off before they run up to seed, with about four or five inches of the stalks, and a great number of side shoots, produced from the stem, will succeed them, and continue fit for eating till the middle of March. They will not indeed be so large as the former, but they will be full as well tasted. The skin of the stalks should be stripped off before they are boiled.

The Roman or purple brocoli, the Naples or white brocoli, and the brown or black brocoli, are the sorts cultivated in the kitchen garden. The former



former of these is the best flavoured, and continues longest in season; for which reasons it is the most esteemed. The white brocoli tastes so like the colliflower, that it is not always easy to distinguish them. The brown or black sort is the least delicate; but it is the hardiest, and grows to the largest size.

For a second crop, to supply the table after the first is gone, Mr. Miller advises \* the sowing of brocoli again in the beginning of July: but Mr. Switzer thinks it wrong to sow this plant even so late as Midsummer, "because says he", its stems will not "be strong enough before the winter to produce "that number of sprouts which otherwise they "would." He therefore prefers portioning out the plants into three parts, and cutting their heads off entirely within a foot and an half or two feet, of the ground; beginning to do this to one parcel about a fortnight before Michaelmas, to the next about a month after, and to the last about a fortnight or three weeks before Christmas; by which means a continued succession of sprouts will issue from the sides of their remaining stems. — Mr. Miller's method here will produce the largest heads, and Mr. Switzer's the greatest number of small ones.

The common practice of earthing up the stems of the brocoli plants from time to time, cannot be near so beneficial as frequent deep digging and stirring of the ground between them, according to the principles of the new husbandry. We have already seen <sup>z</sup> remarkable instances of the advantage of this culture applied to cabbages, of which this is a species.

\* *Gardener's Dict.* Art. BRASSICA.

y *Method of raising Italian Brocoli, Spanish Cardoon, &c.* p. 2.

z *Vol. III. p. 198. — 200.*



The seeds of brocoli are saved in the same manner as those of the common cabbage; or if there be any difference, it is in regard to the white brocoli, of which it is best to reserve a few of the largest heads of the first crop, and let them run up to seed, carefully stripping off all the under shoots, so as to leave only the main stem. If this is duly observed, and no other sort of cabbage is suffered to run up near them, the seeds of the white brocoli will be obtained as perfect here, as any that are imported from abroad; nor will the plants produced by them degenerate in many years.

*Cabbages* of all sorts delight in a deep, rich, light, and well loosened mould, in an open situation. They will indeed grow in any ordinary ground that has been well dug; but the better the soil and it's tilth are, the finer and better flavoured these plants will be.

The early and the sugar-loaf cabbages, commonly called Michaelmas cabbages, are the sorts generally sown for summer use. The most proper season for sowing them is about the end of July, or beginning of August. When the plants have seven or eight leaves, they should be removed into beds of well prepared mould, and there set about three or four inches asunder every way, that they may grow strong, without running up in height; and towards the end of October, they should be transplanted again, into the place where they are to remain. They should here be set in rows three feet asunder, and two feet and an half distant from each other in the row. They must be kept clear from weeds, and should either be earthed up from time to time, as is the common practice, or, which will be much more beneficial, the ground between them should be repeatedly dug pretty deep, or otherwise well stirred and loosened, during their growth



growth, as before directed for their culture in the field <sup>a</sup>. About May, they will turn in their leaves for cabbaging; and if this is helped then by tying them up pretty close with a slender twig of osier, their heads will be blanched in the middle, and fit for cutting, at least a fortnight sooner than they would be if not tied up. But it is to be observed of this early kind, that it completes it's cabbaging very soon after it has once begun to turn, and almost as quickly afterwards becomes hard and bursts. The sugar-loaf sort, which is not so close leaved, grows and cabbages more slowly, and continues good for a longer time.

The musk cabbage, which requires exactly the same culture as the former, will be fit for use in October, and will last till Christmas: but it is much more apt to be killed by hard weather.

The common white, red, flat, and long sided cabbages are cultivated chiefly for winter use. The time for sowing them is the beginning or middle of April. The young plants of these sorts, like those of all other cabbages, should be pricked out into shady borders, when they have got six or eight leaves, that they may acquire strength, and not run up with high stems; for the shortest shank-ed cabbages are always found to succeed best. Towards the middle of June, they should be transplanted from these borders into the places where they are to remain, at the distance of two feet and an half from each other, in rows three feet and an half asunder; for this will be sufficient, either for earthing up their stems, as is the common way, or for the much more beneficial method of digging and stirring the earth between them. If they are planted out in a dry season, they should be watered every other evening till they have taken fresh root.

<sup>a</sup> *Ibid.*

The kitchen gardeners near London generally plant rows of these cabbages between their artichokes, colliflowers, &c. as was observed before; but they seem, upon the whole, to do best when planted alone. They will begin to be fit for use soon after Michaelmas, and will continue good till the end of February, if the winter be not so severe as to destroy them. This may be prevented by pulling them up in November, trenching the ground up in ridges, laying the cabbages as close as possible, on one side, against those ridges, and then burying their stems in earth thrown over them. They may be kept thus till after Christmas: for though their outer leaves may decay, as they often will in very wet or hard weather, their inside will remain sound, if they were large and hard when thus laid down.

Savoy requires exactly the same treatment as the foregoing, excepting that, as they do not grow so large, they need not be planted so far asunder. Two feet and an half square will be a sufficient distance between them. They always thrive best in an open situation, quite free from trees and hedges; for they are very apt to be greatly preyed upon by caterpillars and other vermin, in close places, especially if the autumn prove dry. They are most esteemed after they have been pinched by the frost.

The management of the Russian cabbage, which is so hardy as to bid defiance to the severest winter, differs not from the foregoing in any shape, unless it be, that, like the savoy, it should not be sown till late in the spring, and, being very small, it does not require much space when planted out. It should likewise have a clear open ground to grow on; but it will not last long before it will burst and run up to seed. Many think it a very sweet and well tasted plant, though it is not now cultivated



vated near so much as it used to be. The trading gardeners around this city seem to have excluded it entirely from their grounds; perhaps chiefly because of it's smallness: but it merits still to find a place in private kitchen gardens.

The turnep-rooted cabbage is much esteemed in Germany; but it is here deemed too coarse and strong. However, a hard winter, for it will bear a great deal of cold, will in a great measure remove both these objections. It's culture is the same as that of other cabbages; but it should not be sown much before the end of the spring.

The Sea cabbage, which grows naturally upon the gravelly shores in several parts of England, and particularly, in great plenty, in Sussex and Dorsetshire, where many people dig it up from among the gravel, in the spring, and prefer it to every other kind of cabbage; is, in that blanched state, before it's shoots have been exposed to the air, very sweet and tender, and may be easily propagated in gardens, by sowing it's seeds soon after they are ripe, in a sandy or gravelly soil. It will thrive there exceedingly, and increase greatly by it's creeping roots: but it's heads will not be fit to cut before the second year. To have it in perfection, a layer of sand or gravel, four or five inches thick, should be spread, at Michaelmas, upon the bed in which these plants grow, in order to allow a sufficient depth for cutting their shoots before they appear above ground; for, till then, they will be white, tender, and well tasted: but the air, if they are permitted to grow up into it, soon renders them green, tough, and bitter. This earthing up, or rather new sanding or gravelling of the bed, should therefore be repeated every autumn, in the same manner as is practised for asparagus. It is the only culture that this sort of cabbage will require.

The best method of saving the seeds of all sorts of cabbages has been directed in the preceding volume of this work, to which I therefore refer<sup>b</sup>; there being no sort of difference, in this respect, between those that are cultivated in the field, and those which are raised in the kitchen garden: but it will be right, in either place, to observe Mr. Miller's caution<sup>c</sup>, not to plant more than one sort in the same spot, or near together, when they are intended for seed; for example, never to intermix red cabbages with white, or savoys with either of them, because the commixture of their *farina fecundans*, or male dust, will almost certainly produce a mixture of kinds. It is wholly owing to this neglect, that the English gardeners seldom save any good seeds of the red cabbage, but import them annually from abroad, upon the false supposition that the soil or climate of this country makes them change from red to white, or to a colour between both: but if they were to plant red cabbages by themselves, for seeds, and not suffer any other sort to stand near them, there is no doubt but that the species might be continued here, as perfect as in any other place.

*Cardoon* (*the Spanish*), so called because it is much used in Spain, is a kind of wild artichoke, propagated only by its seed, which is of an oval form, about as big as a grain of wheat, of a very dark green or blackish colour, and marked with black streaks from one end to the other. There are two seasons for sowing it: the first is, from the middle to the end of April; and the other, about a month later. The soil should be rich, deep and fine. In a bed of such mould, four or five feet wide, two trenches are opened, a foot wide, six inches

<sup>b</sup> See Vol. III. p. 195.

<sup>c</sup> Gardener's Dict. Art. BRASSICA.



deep, and at least three feet asunder: or, to answer the same intention, two rows of holes, of that depth and diameter, are dug strait by a line stretched along the bed. These holes should be three feet asunder, and in quincunx order; or, if a trench is used, the quincunx form should be observed in the sowing of the seeds, which is performed thus: Five or six of the seeds are dropped nearly together, at the distances before mentioned, and then covered over: not with a design to let so many plants grow close together in a thick cluster; but, as the growth of these seeds is somewhat precarious, to be the more certain of having two or three plants at each stated distance: for if all of them come up, they are immediately thinned to that number; and if they miscarry entirely in any one spot, the chasm is filled up with plants taken from another place, generally a hot-bed, on which some of these seeds are most commonly sown when it's heat is expiring, for a recruit in case of need. The first sowing will generally come up in three weeks, and the latter in about fifteen days. Great care must be taken to keep these plants clear from weeds, and to water them frequently, in order to make them increase in bulk, and not run to seed. But this intention of M. de la Quintinie and Mr. Switzer will certainly be much better answered in every respect, by a proper application of the principles of the new husbandry; that is to say, by deep and frequent stirring of the earth on each side of the bed; even so as not to fear letting the spade approach to within a very few inches of the plants.

Towards the latter end of October, the cardoons thus cultivated will be fit for tying up, in order to their being blanched. To this end, a dry day should be chosen, all the leaves of each cluster should be collected close together, and wisps of

straw, or long litter, should then be twisted around them, so as to prevent the access of air to any part of them, except their very top, which should be left open. In a fortnight or three weeks, the plants thus covered will become white, and fit to eat.

This tying up and blanching of cardoons may be continued till the winter approaches; and then, those who are so fond of them as to think it worth their while to be at the trouble, may take them up with some earth about their roots and remove them into a green-house, if they have one, or into a cellar, and by that means keep them for use all the winter. Some of these may be replanted in the spring, in an open border as before, to seed in June or July; or they may be cut down to the ground when thus planted anew, and their second year's shoots may be tied up and whitened as before.

Besides the use which the French, Italians, and Spaniards, make of this cardoon, in eating it raw with pepper, salt, oil, and vinegar; many think it preferable to celery, when stewed, because it is mellow and much more tender.

*Celeriac*, which is a species of celery, should be sown at two or three different times, in order to have, during the whole season, a succession of plants which do not run up to seed. The first sowing may be in the beginning of March, in which case it should be upon a gentle hot-bed, on account of the rawness of the weather at that time of the season: the second may be at the end of the same month, in an open spot of fine, rich, moist, and light earth, fully exposed to the warmth of the sun: and the third should be by the latter end of April, or in the beginning of May, likewise on a rich and moist soil, distant from the drip of trees. If this ground is exposed to the morning sun only,



it will be so much the better. These seeds must be watered frequently, if the weather is dry; for otherwise they will not grow: but with this care they will put forth plants in about three weeks or a month, and these will be fit to transplant in five or six weeks after their coming up. When this is done, they should be pricked out at the distance of about three inches square from each other, in well prepared, and warmly situated, beds of moist rich earth: and if the season prove cold, these beds must be covered with mats, to defend the young plants from morning frosts, which would greatly check their growth, or perhaps even kill many of them. In drawing them out of the seed-bed, care should be taken to thin them where they grow too thick, and to leave the smallest to get more strength before they are removed. By this means the same seed-bed will afford three different plantings, which will succeed each other for use.

By the middle of May, some of the first transplanted plants will be fit to remove again, for blanching: and herein only it is that the culture of celeriac begins to differ from that of celery. This last is transplanted into trenches, and there earthed up, as will be directed in the next article: but celeriac, which seldom grows above eight or ten inches high, and therefore requires but little earthing up, should be planted in level ground, or in very shallow drills; its great excellency being the size of its root, which often grows as large as an ordinary turnep, even in the common way of setting these plants only six or eight inches asunder in rows sixteen inches apart, and earthing them up but once. — The judicious reader will here immediately apply to this plant, the far superior method of culture used in the new husbandry; and will, in consequence thereof, see at once the expediency of setting these roots at such distances

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distances as to allow proper room for stirring of the earth between them, to a sufficient depth. There can be no doubt of it's improving their taste, or of it's greatly augmenting their size: for the richer, finer, and looser the mould is in which they grow, provided it be moist, the larger, sweeter, and tenderer they will be. Frequent digging, or deep hoeing, about these plants, will also be attended with the farther advantage, first, of keeping them clear from weeds, which is absolutely necessary; and secondly, of preventing their piping, or running up to seed, so soon as they generally do when managed in the common way.

*Celeri* requires exactly the same treatment as celeriac (which see above) till it is transplanted for the second time, in order to it's being blanched. The usual way of performing this, is to dig a trench, by a line, about ten inches wide, and eight or nine inches deep, in a moist, rich, and light soil; to loosen and lay level the earth at the bottom of this trench, and to throw up on each side a ridge of the mould taken out, that it may be in readiness there for afterwards earthing the celery. These trenches are generally three feet asunder; which is a sufficient space for digging between them after they are filled up. When the young plants have been trimmed, and the tops of their longest leaves cut off, they are set in one strait row in the middle of the bottom of the trench, at about four or five inches distance from each other; their roots are then covered with mould trodden down close to them; and care is taken to water them plentifully, till they have struck out new roots. As these plants advance in height, fresh earth is drawn in close to them on each side, but with great caution not to bury their hearts, or ever to do this in wet weather, lest it should make them rot. When they are grown  
con-



considerably above the trenches, and all the ridges have been employed in earthing them up, a spade is used to dig up more earth from between the rows, and this is continued till they are fit for use. —But, whenever this is done, good deep digging, as near as can be to their roots, so as to lay fresh earth to them, would certainly be attended with all the advantages of which we have seen numerous similar instances in the practice of the new husbandry with a horse-hoe, and they may at the same time be earthed up equally well.

The celery first planted out will be fit for use about the end of July. This will be succeeded by the after plantations; and the latter sowings, if rightly managed, will yield a constant supply of it till April. The last crop should be planted in a drier soil than any of the preceding; and to prevent it's being rotted by much wet in winter, it will be right to cover the ridges, especially if there is any danger of hard frost, with peas-haulm, or some other light covering, which will not smother the plants: for covering them too close would also make them rot. However this will suffice to keep the frost out of the ground, so that the celery may be taken up whenever it is wanted; which it cannot be if the earth around it is hard frozen. But this covering must be taken off as early in the spring as the weather will permit, lest it should make the plants grow pipy, and run to seed.

Celery will not continue good above three weeks or a month after it is fully blanched, but will then grow hollow, or rot. A succession of at least six or seven different plantings is therefore necessary for those who would have a constant regular supply. For a single family, even though a large one, much need not be planted at each time.

The best way to save the seeds of celery, or of celeriac, is to single out some of the largest and finest roots, which have not been too much blanched, and to plant them, for the celery twelve, for the celeriac eighteen, inches asunder, in a moist soil, early in the spring; and when they run up to seed, to support them with stakes, to prevent their being broken down by the wind or other accidents. In July, when the seeds begin to be formed, it will be right to water the plants if the season proves very dry; for this will greatly help them to produce good seeds: — or perhaps the same end may be answered full as effectually, if not more so, by keeping the earth around these plants well and deeply stirred, and therefore loose and moist, by digging it in the manner which the practisers of the new husbandry have found to be so very beneficial, on this as well as other occasions. These seeds will be ripe in August, at which time they should be cut down, in dry weather, spread upon cloths in the sun to dry, then beaten out, put into a bag, and laid up in a dry place.

*Colewort* (the common), or Dorsetshire kale, has been of late beaten out of the kitchen grounds near London, by the trading gardeners, who find their account better in setting, in lieu of it, cabbage plants, or sprouts. Its culture is exactly the same as that of the common cabbage; and it has the valuable qualities of being extremely well tasted, and so hardy that no frost will kill it. I have already spoken of the curled colewort, or Siberian borecole<sup>d</sup>.

*Colliflowers* should be raised from the very best seeds that can possibly be procured; for on this their goodness will greatly depend. Mr. Miller is so minutely particular in his directions for cultivat-

<sup>d</sup> See p. 63.



ing these plants, which he seems to have attended to more carefully than any other writer upon gardening, that I cannot do justice to my readers better than by methodising the substance of what he has said on this subject<sup>e</sup>. He is almost scrupulously exact in fixing particular days for the sowing of this seed, for the very good reason that a difference of only two or three days has often been known to make a great difference in the plants, and that the numerous class of gardeners about London have experienced their crops to succeed best when sown at the times which he advises; though he allows that one day, more or less, will not make any great odds. His rules are calculated for the latitude, climate, and situation of the gardens around London; but they may, especially with the help of a little experience, be easily suited to any other place.

In order to have very early colliflowers, the seeds of an early sort should be sown on, or about, the twenty first day of August, upon an old cucumber or melon bed, which has entirely lost it's heat. They should be distributed rather thinly than otherwise, and covered with about a quarter of an inch thick of fine earth sifted over them. If the weather proves very hot and dry, this bed should be shaded with mats, to prevent the too quick drying of the earth, and, if there be occasion, it may be watered a little from time to time. In about a month after sowing, the plants will be fit to prick out. This should be on other similar old cucumber or melon beds covered with fresh mould; or, if these cannot be had, on beds made on purpose with a little new dung, and covered with mould like the former. This dung should not be at all hot; for that would hurt the plants

<sup>e</sup> *Gardener's Dict.* Art. BRASSICA.



greatly at this season, which generally is sufficiently warm ; and it should be trodden down very close, to prevent the worms from getting through it. The young plants should be set in this bed about two inches square asunder, and they should be shaded and watered there till they have rooted anew : but great care should be taken not to water them too much after they have begun to grow, and likewise not to suffer them to receive too much rain, if the season should be wet, lest they should become black shanked, as the gardeners term it, meaning, rotten in the stem : for whenever this happens, the plant so affected is inevitably lost. They must be kept very clear from weeds in this bed, and about the thirtieth of October they should be transplanted from thence into the place where they are to remain during the winter.

This spot should be well defended from the north, east, and west winds, by walls, pales, or reed hedges, which last are by far the best, because the winds do not reverberate from them, as they do from the former. The ground here, besides being naturally rich, should be well and deeply trenched, and a good quantity of thoroughly rotten dung should be buried in it. If the soil is naturally wet, it should be raised up in beds about two feet and an half or three feet wide, and four inches above the level of the spaces between them : but if it is moderately dry, the whole surface may be left flat. If it is very dry, the plants should be watered a little, as soon as they are set ; but by no means so as to make a puddle around them, as some very improperly direct.

Along the middle of each of these beds, or of each breadth of ground that would be allotted for a bed, a row of the young plants of colliflowers, now transplanted for the second time, should be set at such distances from each other  
that



that there may be a clear space of about two feet and an half between the bell or hand glasses with which they are to be covered during the winter: but two good plants should always be set, at this time of planting them, under each glass, about four inches asunder. If these colliflowers are intended for a full crop, the rows should not be nearer together than three feet and an half: and if ridges for cucumbers are to be made between them, as is the general practice of the gardeners near London, they should be full eight feet asunder.

When the plants are thus set, the glasses should be put over them, and kept close down till they have taken root, which will be in about a week or ten days: but if a kindly shower of rain should fall in the mean while, it will be right to uncover the plants, that they may receive the benefit of it. In about ten days after this planting, the glasses should be raised three or four inches on their south side, and supported there with forked sticks, or bricks, so that the plants may have a free access of air; and thus the glasses should remain over them, night and day, except in frosty weather, when they should be let down again as close as possible: or if it should prove very warm, as often happens in November, and sometimes even in December, the glasses may be taken entirely off in the day time, and put on again only in the night; lest the plants, by being kept too close, should be drawn into flower at that season, as is frequently the case in mild winters, especially if they are not skilfully managed.

Towards the end of February, if the weather is mild, another good spot of properly fenced ground should be well trenched and dunged as before, and the least flourishing of the two plants under each glass (for the strongest is not to be removed



moved any more) should be carefully taken up with a trowel, so as to preserve as much earth as possible about it's roots, and at the same time not to damage the other. The plants thus taken up are to be set in this newly prepared ground, at the same distance as before; that is to say, if for a crop of colliflowers only, the rows should be three feet and an half asunder; but if for ridges of cucumbers between them, eight feet, and the space from plant to plant, in the rows, should be twenty eight or thirty inches.

The plants left under the glasses should be earthed up, by drawing the mould towards their stems, with a small hoe, as soon as these others have been removed from beside them: but in the doing of this, great care must be taken not to let any of the earth fall into their hearts, lest it should rot them, or at least considerably injure their future growth. After this earthing, the glasses should be set over them again, but an inch or two higher than before, to give them more air, and with the precaution of taking them quite off whenever gentle showers descend: for these will always greatly refresh the plants.

When they begin to grow apace, and to fill the glasses with their leaves, which they will soon do after this little stirring of the ground, the earth around them should be dug as deep and as near to the plants as can be without hurting them: for this will speedily bring them very forward. In this digging, a kind of border may be raised around them, broad enough for the glasses to stand on, and about four inches high, which, with the farther help of a continuation of props to support them, so as to let in the air, will give the plants such increase of room, that the glasses may be continued over them till April: an advantage which they could not otherwise enjoy, without prejudice to their



their leaves; and of so much the greater consequence, as there frequently are, in this country, such severe returns of frost about the latter end of March, as would greatly hurt these plants, if exposed thereto, especially after having been tenderly nursed under glasses.

When the plants removed into the new spot of ground have been set, which it is best to do at the distances before mentioned, glasses should be placed over them, pretty close, till they have taken fresh root: the props of these glasses should then be raised pretty high, especially if the season be mild, in order that there may be free access of air to the plants, to strengthen them; and in mild soft weather, as well as in gentle showers of rain, the glasses of these, and of the other plants, which were left standing, may be taken off entirely; for it will now be time to begin to harden them all by degrees, in order to enable them to bear the quite open air: but even while this is practised in the day, the glasses should be continued over them as long as possible at night, if there be the least danger of frost. A farther essential caution, relative to the day, is never to let the glasses remain upon these plants when the sun shines very hot, especially if their leaves spread so as to press against the sides of the glass; for the moisture which arises from the ground, together with that which proceeds from the perspiration of the plants, has, by being detained upon their leaves, frequently been so heated by the next day's sun, powerfully heightened by means of the glass, as absolutely to scald all the larger leaves, to the great detriment of the plants; and sometimes so as to affect even the whole of the plants, in such manner that they have not been worth cultivating afterwards.

If the plants have thriven well, some of them will begin to fruit by the end of April. It will  
 N<sup>o</sup>. 32. VOL. IV. F therefore



therefore be necessary then to look them over carefully at least every other day, and where the flower appears plainly, to break down some of the inner leaves, so as to cover it and shade it from the sun, which would otherwise soon render it yellow and unsightly. When the flower is full grown, which is known by the gapping and parting of it's surface, as if it would run to seed, the whole plant should be drawn out of the ground, and if it's head is wanted for present use, it may then be cut out of the leaves: but if it be designed for keeping, it should be laid in a cool place, with it's leaves about it. This is much better than the slovenly method of those who cut off the heads of colliflowers as they stand, and leave in the ground their then useless stalks, with perhaps several as useless leaves, which serve only to taint the air around them. The most proper time for drawing them, is early in the morning, before the sun has exhaled any part of their moisture: for those that are gathered in the heat of the day, lose their natural crispness, and become tough.

The second crop of colliflowers, which the gardeners near London call the great crop, is that which generally supplies the markets here in May, June, and July. The seeds for this are of a somewhat more backward kind than those of the former, and they are also most commonly sown four or five days later. The manner of sowing them, and of managing the plants produced from them, is in all respects exactly the same as before directed for the early crop, until the end of October. From that time, the practice of the London gardeners, who carry on a great trade in this article, is as follows.

Upon a couch of dung, beaten down close with a fork, in order to render it the more difficult for worms to pierce through it, they place a layer of good fresh earth about four or five inches thick

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The thickness of the dung is from six inches to a foot, according to the size of the plants; the smallest requiring most, to bring them forward. The plants are set in the mould of this bed at the square distance of about two inches and an half from each other, and they are shaded and watered till they have taken new root. The number of these beds is proportioned to the quantity of the plants, and they are covered either with glass frames, or with hoops, over which mats, &c. are spread: but great care is taken not to keep these coverings close, because the warmth of the dung (for that which is used here must not have lost the power of fermenting) will occasion a considerable damp, which would greatly injure the plants, if it were pent in. When they have taken root, as much free open air as possible is given them, by taking the coverings off in the day-time, whenever the weather permits, and raising them up with props at night, unless the air be frosty: for in this last case they are then shut down close; and in very hard frosts the glass frames are covered with mats, straw, pea-haulm, &c. Great caution is likewise used to guard the plants against heavy rain in the winter; and if any of their under leaves grow yellow, or decay, at that season of the year, particular care is taken to pick them off in as mild a day as can be chosen; because, if the weather should prove so very bad as to occasion a necessity of keeping the covers close down for two or three days together, those decayed leaves would render the inclosed air so hurtful to the plants, (then in a state of great perspiration, by reason of their close confinement,) that numbers of them would soon be destroyed.

Early in February, if the weather is tolerably mild, they begin to harden these plants by degrees, in order to prepare them for transplantation.

The ground into which they are to be transplanted, besides being quite open from trees, rather moist than dry, and well dunged and dug, as before directed, is, when managed in the most proper manner, sown with radishes a week or a fortnight before the colliflowers are planted in it. Mr. Miller recommends this very particularly, for this excellent reason, that if there are not some radishes among them, and the month of May should prove hot and dry, as it sometimes is, the fly will seize the colliflowers and eat numbers of holes in their leaves, to the great prejudice, if not to the entire destruction, of these plants; whereas, if there are radishes upon the spot, the flies will take to them, and never meddle with the colliflowers so long as the others last. The gardeners near London, who are obliged to make the most of their ground, mix spinage with their radish seed, and thereby have a double crop between their colliflowers: but, that consideration excepted, it may be best to sow but one crop with the colliflowers, that so the ground may be cleared in due time.

Towards the middle of February, if the season is good, they begin to plant these colliflowers out in rows. The usual method of those who raise a variety of other crops between them is, to leave a space of four feet and an half between the alternate rows, of two feet and an half between the intermediate ones, and of twenty six inches from plant to plant in the rows. About the end of May, or beginning of June, by which time the radishes and spinage are cleared off, they set seeds of cucumbers for pickling along the middle of the wide rows, at the distance of three feet and an half asunder; and in the narrow rows they plant winter cabbages twenty six inches apart, so that each of these stands exactly in the middle of the square



square between four colliflowers, and therefore has ample room to grow in after the colliflowers are gone. By this means there is a fucceffion of crops during the whole feafon.

Some raife a third crop of colliflowers, by making a flender hot-bed in February, fowing the feeds thereon, fifting light mould over them to the thicknefs of about a quarter of an inch, and then covering the whole with glafs frames. When the plants have four or five leaves, they remove them into an other hot bed, where they plant them about two inches afunder every way, and in the beginning of April they harden them by degrees, to fit them for being transplanted again. This is moft commonly done in the midde of that month, at the diftances beforementioned for the fecond crop, like which this is from thenceforth managed in every refpect. If the foil in which thefe colliflowers are planted is light, and the feafon likewise reafonably moift and cool, they will produce heads fit to be cut about a month after the fecond crop is gone.

The table may continue to be fupplied with colliflowers after Michaelmas, through the months of October and November, and often during a great part of December, if the feafon be favourable, and the foil good; by fowing them about the twenty third of May, and transplanting them in the manner beforementioned.

The gardeners about London have almoft wholly laid afide the troublefome, expenfive, and little ufeful practice of watering their colliflower plants in the fummer; and Mr. Miller very juftly blames thofe who ftill perfift in that old method; becaufe, “ if the ground is fo very dry as not to  
 “ produce tolerable good colliflowers without water,  
 “ it feldom happens that watering of them renders  
 “ them much better: and when once they have

“ been watered, if it is not constantly continued,  
 “ it had been much better for them if they never  
 “ had any ; as also, if it be given them in the  
 “ midde of the day, it rather helps to scald them :  
 “ so that, upon the whole, if care be taken to  
 “ keep the earth drawn up to their stems, and  
 “ clear them from every thing that grows near  
 “ them, that they may have free open air, they  
 “ will be found to succeed better without than  
 “ with water, where any of these cautions are not  
 “ strictly observed.”

That deep and repeated stirrings of the earth around colliflowers, after their last transplantation will, alone, keep the soil sufficiently moist; and that they may be raised in great perfection, without any dung at all, by only observing the principles of the horse-hoeing husbandry ; is very manifest from M. de Chateauvieux's beforementioned experiment <sup>f</sup>, than which there cannot be a stronger proof of the rectitude of Mr. Miller's opinion here. If this experienced gardener had but directed good digging about their roots, instead of drawing the earth up to their stems, his method would have been complete.

*Parsley* is multiplied only by it's seeds, which are small, of a greenish grey colour, a little bending inward on one side, and streaked all over. They should be sown, in fine mould, as early in the spring as the frosts are over, because they seldom sprout in less than six weeks. The sorts generally cultivated in the kitchen garden are, the common parsley, the curled parsley, and the long rooted parsley.

The two first of these are usually sown in drills, along the edges of the borders, because it is much easier there to keep the plants clear from weeds,

<sup>f</sup> See Vol. III. p. 201.



and to cut them when wanted, than if they were scattered promiscuously over a wider space of ground. The larger rooted parsley should, after it is come up, be thinned so as to leave a space of some inches between the plants in each row: for this sort should always be set in regular rows, at sufficient distances, to afford room for digging or otherwise stirring of the earth between them, in order to promote the increase of it's roots, for which only it is cultivated in the garden. The largeness of it's leaves, and their much darker green, easily distinguish it from the common parsley, independant of it's six times bigger roots. If rightly managed, these will be fit to draw in July. The markets in Holland are stored with bunches of them, as ours are with young carrots, in the summer; and indeed, thanks to Mr. Philip Miller, who first propagated this species here, the good markets in London are not now without them, in their proper season. The method and advantages of raising each kind of parsley in the field, for the use of cattle, have been treated of in my former volume §.

To preserve the curled parsley unmixed, it's seeds should be carefully saved from plants whose leaves are well curled; for these will always produce the same species: but the only way to do this effectually, is to separate the plain leaved from the curled, by taking them up, as soon as their difference is discernable, and leaving only the sort that is desired: for it is impossible to know the one from the other by their seeds.

The curled parsley is so remarkably different from hemlock, that it is by much the safest sort to sow by those who are at the least loss to distinguish

§ See Vol. III, p. 178—180.

that poisonous weed from the common plain-leaved parsley.

*Smallage*, or water parsley, which is the plant that physicians indicate when they prescribe *Apium* (for the common parsley is what they call *Petroselinum*), grows naturally by the sides of brooks and ditches in many parts of England, and is rarely cultivated in gardens. Those, however, who are fond of it in their pottage, may raise it in a moist soil, either by slips, or from seeds sown in March. This seed is reddish, and pretty big, of a roundish oval shape, a little more full and rising on one side than on the other, and streaked lengthwise.

*Spinage* requires a rich, light, and well loosened soil. It is propagated by its seeds only, of which there are two sorts, namely, the rough and prickly, which produces the prickly spinage with arrow-pointed leaves, and the smooth, from which springs the spinage with oblong oval leaves.

The seeds of the first of these kinds, which is by much the hardiest, and therefore fittest to be cultivated for winter use, should be sown upon an open spot of ground, in August, just before a shower of rain, if it can luckily be so timed: for if the season should prove dry for a long while after the sowing, many of them will not sprout at all, and the plants of those that do grow will come up so irregularly, that half the crop will frequently be lost. It therefore is highly advisable to water these seeds within two or three days after their being sown, if rain does not fall in the mean time.

When the plants begin to be strong, the ground on which they grow should be well hoed, to destroy the weeds, and to thin the plants to the distance of three or four inches asunder. This, like all other hoeings, should always be performed in  
dry



dry weather, the more effectually to kill the weeds: or, if it be rainy, they should be carried off the ground as soon as they are cut up, to prevent their taking fresh root: for if many of them spring up, and the season prove wet, they will stifle the plants of spinage, and make them rot. A second careful hoeing is therefore necessary in about a month or five weeks after the first; and with the help of this the spinage will begin to be fit for use by the end of October. The best way of gathering it is, to crop off only the largest outer leaves, and to leave the middle ones to grow bigger: for by this means a regular supply may be had during the whole winter, and even till the subsequent spring sowing shall have produced plants large enough for use, which generally is in April. The winter spinage will also then be ready to run up, and should therefore be entirely cleared off, unless a parcel be left for seed, if wanted. But if early cabbages, which will want earthing up, have been planted among this spinage, as is the usual practice of the gardeners about London, a separate small spot of ground should be allotted purposely for sowing some of this spinage for seed, without any other plants among it, and to cut up all the remains of the other winter crop, as soon as the spring spinage is fit for use.

The oblong oval leaved spinage, commonly called plantain spinage, which has thicker leaves and more succulent stalks than the former sort, is sown in the spring, likewise upon an open spot of fine rich earth. The London gardeners, who always endeavour to have as many crops in a season as they possibly can, generally mix radish seeds with those of the spinage which they sow at this season: but the best way for those who have ground enough, is to sow their spinage seeds alone. This crop must be hoed, cleared from weeds, and  
thinned

thinned, in the manner before directed for the winter spinage; and when the plants, which were at first left three or four inches asunder, have grown so as to meet, it will be right to cut them out here and there for use, and to thin them in this manner, as they are wanted for the table, till those that are left, stand eight or ten inches asunder. The thinnings in the mean time will give the remaining plants room to spread; and if, after this last, the ground between them is well stirred to a good depth, and kept perfectly clear from weeds, this sort of spinage will frequently produce leaves as large as those of the broad leaved dock, and extremely fine.

A succession of spinage may be had throughout the whole season, by sowing it every three weeks, from about the middle of January to near the end of May; only observing, that the earliest sowings must be upon the naturally driest soils, and that the latest should be thinned most at their first hoeing, because the remains of the former crops will furnish a supply till these are full grown, and the plants will not be so apt to run up to seed when they stand at a distance from each other, as when they are close together.

In order to have good seeds of spinage, each particular sort should be sown by itself, in an open spot of rich and well dug ground. This sowing should be in February, as soon as the danger of frost is over; and when the plants are come up, they should be thinned with a hoe till they are six or eight inches asunder every way. All weeds should at the same time be carefully cut up and carried off: and in about three weeks or a month after this, the plants should be hoed and thinned a second time. Their distance from each other should then be enlarged to at least twelve or fourteen inches: for they will cover the ground  
very



very sufficiently after they have shot out their side branches. Particular care is requisite at this time to keep them very clear from weeds; because these would make the plants of spinage run up weak, and thereby greatly injure them.

Mr. Miller is here extremely judicious in his directions for the farther management of spinage intended for seed. “When the plants, says he<sup>h</sup>, “have run up to flower, you will easily perceive “two sorts among them, *viz.* male and female. “The male will produce spikes of stameneous “flowers, which contain the farina, and are absolutely necessary to impregnate the embryos of “the female plants, in order to render the seeds “prolific. These male plants are, by the gardeners, commonly called the spinage, and are “often, by the ignorant, pulled up as soon as they “can be distinguished from the female, in order, “as they pretend, to give room for the seed bearing to spread: but, from several experiments “which I have made on these plants, I find that, “where-ever the male plants are entirely removed “before the farina is shed over the female plants, “the seed which they produce will not grow, so “that it is absolutely necessary to leave a few of “them in every part of the spot, though a great “many may be drawn out where they are too “thick; for a small quantity of male plants (if “rightly situated) will be sufficient to impregnate a great number of female, because they “greatly abound with the farina, which, when “ripe, will spread to a considerable distance, when “the plants are shaken by the wind.”

When the seeds begin to ripen, they must be guarded from birds; and when they are thoroughly ripe, which is known by their changing their

<sup>h</sup> Gardener's Dict. Art. SPINACIA.

colour, and beginning to shed, the plants should be drawn up, and spread upon cloths, for a few days, to be completely dried by the heat of the sun. That they may be perfectly so, they should be turned every other day; and when they are quite dry, they should be threshed out, well cleaned, and laid up in a dry place, where mice, which are excessive fond of this food, cannot come at them.

### A R T I C L E III.

#### *Of Legumes.*

**B**EANS of all kinds thrive best in a rich, stiff, deep, and well loosened soil, in which they should be planted at the depth of from five to six inches, according to their several sizes. The sorts proper for the kitchen garden are, the Mazagan, the early Portugal, the small Spanish, the broad Spanish, the Sandwich, the white and black blossomed, and the Windsor bean.

The Mazagan, which is brought from a Portuguese settlement of that name, on the coast of Africa, just beyond the streights of Gibraltar, is the first and best sort of early beans. If these are sown in October, in a warm situation, under a wall, pale, or hedge, and their plants are carefully kept clear from weeds, and earthed up when they are advanced in growth, they will produce fruit fit for the table by the beginning of May: but as their stems are very slender, and the morning frosts are sometimes severe in the spring, it will be right to support them by strings extended along their rows, and fastened to stakes, to prevent their dropping to the ground when the frost has bitten them much: for that would at least greatly retard their growth, or even, perhaps, be



be a means of their never rising again. To support them thus at a little distance from the fence under which they have been planted, is, for the reasons before assigned<sup>i</sup>, far better than drawing them close up to it, as most writers advise, especially if it be a wall. These beans bear plentifully; but they ripen so nearly together, that more than two gatherings can seldom be had from the same plants. In the place of their natural growth, they are much smaller than our horse-bean; but after two years culture with us, they become much larger, and do not ripen so soon as before. This is called degenerating.

The early Portugal bean, is the sort which the gardeners about London most commonly sow for their first crop: but it is not near so well tasted as the Mazagan, and therefore should not be used wherethat can be had. From it's likeness to the seed of the Mazagan when gathered here after it's first crop in this county, it seems to be the same sort sowed in Portugal.

The small Spanish bean comes in soon after the Portugal, to which it is preferable, because it is sweeter.

The broad Spanish bean supplies the table soon after the former is gone, and a little before the common sorts. It bears well, and therefore is frequently planted.

The Sandwich bean succeeds the broad Spanish, and is almost as large as the Windsor; but, being hardier, it is generally sown a month sooner. This also is a plentiful bearer.

The Toker bean is fit for gathering at about the same time as the Sandwich, and, being a great bearer, it now is much cultivated.

<sup>i</sup> See p. 20.

The white and the black blossomed beans are also much esteemed. The former are remarkably sweet, and almost as green as peas, when they are boiled: but both these sorts are very apt to degenerate, if their seeds are not saved with great care.

The Windsor bean is the best of all for the table. When planted in a good soil, and allowed sufficient room, it will yield great plenty of very large seeds; and when it is gathered young, it is sweeter and better tasted than any other sort: but great care should be taken to pull up all such plants as are not perfectly right, and may chance to be intermixed, and afterwards to separate all the good beans from the bad, when they are taken out of the pods. —As this bean will not bear the frost so well as most of the other sorts do, it is not often planted before Christmas; and it is generally used for the great crop, which is gathered in June and July.

In the usual practice of gardeners, all the early beans are planted in warm borders, near walls, pales, or hedges; and those which are intended for the first crop are generally set in a single row, pretty close to the fence: but, besides the reason before given<sup>k</sup> for not placing, or drawing up, any plants of this kind too close to a wall, it is doubly injudicious here, because the beans, which send forth very many and long roots, which are known to be great impoverishers of the land, and which form a considerable shade after they are grown up, will certainly do more hurt to the fruit trees before which they are planted, than all their own crop can ever be worth. It therefore is much better to run reed hedges across the quarters of the kitchen garden, and to plant the early beans and peas under them: for they will there be more

<sup>k</sup> Page 20.



securely, as well more conveniently, sheltered from frost, and may be drawn up towards them, without any danger, as they increase in their growth.

Those beans which are planted early in October, will come up before the middle of November. As soon as they are about two inches high, the earth around them should be carefully hoed up to their stems; and this should be repeated two or three times, as they advance in height, in order to protect those stems from the frost. If the winter be severe, it will be proper likewise to cover these beans with peas-haulm, fern, or some other light substance; as a still farther security against the rigour of the season: but this covering must always be taken off in mild weather; or it will make the plants run up tall and weak, and consequently prevent their bearing well. The frost is also prevented from penetrating to their roots, by covering the surface of the ground with tanner's bark.

When the beans are about a foot high, which they will be early in the spring, they should be drawn up as close as possible to the reed hedge before mentioned, by a packthread run along their outside. This situation will shelter them from the morning frosts, which are frequently so severe in April, as to lay flat on the ground such beans as are not thus guarded. At this time too, all suckers which proceed from their roots should be carefully taken off; or they will retard the growth of the plants, and hinder their fruiting early. When the blossoms of the beans begin to open toward the bottom of the stalks, the tops of the stems should be pinched off, in order to make the first pods stand, and thereby forward the product of the plants. If these rules are well observed, and if the beans are kept clear from weeds and other plants  
of



of any kind, there will be little danger of their succeeding.

It will, however, be right, in order to guard securely against accidents which may happen to these very early beans, to plant a second crop of them about three weeks after the first, and to repeat this at the end of every three weeks, or month, till February : observing, that sloping banks, distant from a hedge, will suffice for those which are not planted before the end of November, or beginning of December, because they will not appear above ground before Christmas, even though the weather should be mild, and therefore will not be in so much danger as those that were set earlier, especially if the surface of the ground be covered with tan, to keep out the frost.

The later crops of beans should be planted about every fortnight, from February to the middle of May, after which last time it generally is too late to set these legumes, unless the land be very strong and moist : for the late crops of beans raised on warm, dry, and light soils seldom escape the black insects, commonly called black dolphins, which fix on and cover all the upper part of their stems, and soon make them decay.

The principal cautions necessary to be observed in regard to these latter crops are, first, to plant the latest in the moistest and strongest ground, for these seldom come to much in dry places, unless the summer chance to prove wet ; secondly, to keep them very clear from weeds and other plants, which would otherwise exhaust their nourishment ; thirdly, to keep earthing them up, if they are cultivated in the common way, or, which is infinitely better, to stir the earth thoroughly, deep, and frequently between them, according to the practice  
of



of the new husbandry<sup>l</sup>, and to pinch off their tops when they begin to blossom, in the manner, and for the reason before mentioned; fourthly, to set the earliest planted the closest together, in order to allow for the failure of many of them; and fifthly, to allow the largest beans the greatest space to grow in. Mr. Miller, who, from his own experience, judiciously advises the strictest attention to these rules<sup>m</sup>, allows for a single row of the first and second planted beans, which never are of the large sort, two inches between the setting of each bean, and three inches for those of the third and fourth planting; and if either of these are planted in rows across a bank, he would have the spaces between the rows not be less than three feet each. For the Windsor bean, the distance between the rows should not be less than four feet, and these beans should be planted five or six inches asunder in the rows, if they are to yield their greatest produce<sup>n</sup>.

To save the seeds of garden beans, a number of rows, in proportion to the quantity desired, should be set apart for that purpose. These should be managed in the same way as those that are intended for the table, excepting that none of the beans here should be gathered; for the growth of an after-crop never is so large and fair as that of the first; nor should two different sorts, or even two varieties of the same sort, be suffered to seed in the same place, lest they should be hurt by the intermixing of their farina. Those who would preserve their sorts quite pure, should be very attentive to this caution; and for the early kinds in particular, they should save for seeds the finest of those plants

<sup>l</sup> See *Vol. II. p. 380.*

<sup>m</sup> *Gardener's Dict. Art. FABIA.*

<sup>n</sup> See again *Vol. II. p. 380.*



which came up soonest: though few people choose to do this, because they are then most valuable.

When the seeds are quite ripe, the stalks should be pulled up, and set upright against a sunny fence, to dry. Care should be taken to turn them there every second or third day, that they may dry equally; and when that is done, they may be threshed out, cleaned, and laid by for use: or the stalks thus dried, with the beans in their pods, may be stacked up in a barn, or any other dry place, in order to their being threshed out at a more leisure time. But if the quantity be only for private use, and not for sale, the seeds may soon be picked out by hand, by which means the danger of their being bruised by the flail will be avoided. Whichever method is used, it will be right to cull out all the fairest seeds, for they will produce the finest plants. The refuse may be given to cattle.

Beans, like all other vegetables, degenerate, if the successive produce of the same seeds is sown long in the same ground; nor will they, in a few years, yield so plentifully as at first. The best way therefore is, to change the soil and species as often as may be; for this method will preserve the quality of the bean, and the quantity of the crop.

*Kidney-beans* delight in a warm, light, fertile, and pretty dry soil. They are too tender to be sown in open ground before the middle of April; because if the weather should prove cold and wet, their seeds, from which only they are raised, would soon rot; or if the mornings should be frosty, as they frequently are even after the beginning of May, the young plants would be in great danger of being destroyed. The best way, therefore, to have these beans early is, if there be not a conveniency of frames for raising them, to sow the seeds about the latter end of March, or the beginning of April, in pretty close rows, upon a gentle



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gentle hot-bed; but just warm enough to bring up the plants. This bed should be arched over with hoops, in order to it's being covered with mats every night, or in bad weather; and when the plants have begun to put forth their trifoliate leaves, they should be taken up carefully, and transplanted into well dug and well sheltered borders of good mould. If they are transplanted in a dry season, they should be watered a little, to forward their taking root. Their culture afterwards is the same as for those that are sown in the open ground: but it is to be observed, that the transplanted beans seldom grow so strong as those which have not been removed, nor do they bear so long: they will, indeed, be fit for gathering at least a fortnight earlier.

The sorts of kidney-beans most usually cultivated for early crops, are the small white dwarf, the black dwarf, and the liver coloured bean. These are, particularly, the fittest to be raised on hot-beds, or, for want of them, on fine warm borders; and as their stalks never grow very long, their seeds may be planted much closer together than those of the larger kinds; nor will they want much support. They should be sown about the middle of April, and, if they escape the morning frosts before mentioned, they will be fit for use a fortnight sooner than the other sorts.

The manner of planting them in the open ground is, to make shallow furrows, with a hoe, about three feet asunder; to drop the seeds into each of these, about two inches apart; and then to draw the earth over them with the head of a rake, so as to bury them about an inch deep. If the season be favourable, the plants will appear in about a week's time; and as soon as they have raised their heads quite upright, a little earth should be drawn gently over their stems, when



the ground is dry, to prevent their being injured by sharp winds: but in the doing of this, care should be taken not to cover their seed leaves. The only care requisite afterwards is to keep them clear from weeds till they produce their pods. These should be gathered carefully twice or thrice a week: for if they are left but a little too long upon the plants, they will become hard and stringy, the beans in them will be too large for eating, and the plants themselves will be greatly weakened thereby.

The Battersea kidney-bean is somewhat earlier than the Canterbury; but this last continues bearing much longer. Both of these are better tasted than either of the three former sorts: but they are very tough and stringy when they begin to be large.

The trading gardeners around London frequently cultivate two or three other sorts of pretty early kidney-beans, because these, growing with erect stalks which want no support, and not putting out any twining tendrils, require the least care and trouble, and at the same time produce the greatest quantity of pods: but they are inferior to all the rest in goodness. The pods of one of these sorts, in particular, which is that with black and white speckled seeds, have a rank flavour, and become soft and mealy, when boiled.

The second crop of kidney-beans should be sown about the middle of May. The best sorts to obtain this from, are the scarlet blossomed, which, if properly supported, will rise to the height of twelve or fourteen feet; a white bean of the same size and shape, which seems to be only a variety of the scarlet; and the large white Dutch kidney-bean, which grows as tall as either of the former, and therefore must, like them, be well supported, to prevent it's trailing upon the ground, where it  
would



would soon be spoiled. The most delicate of all are the scarlet blossomed, and the white variation of the same species. These are also the hardiest: for though they do not come so early as some of the dwarf kinds, (nor will they be a fortnight later than the Battersea kidney-bean, if sown in the same soil and situation,) they will begin to bear plentifully before the early sorts are over, and will continue so to do till the autumnal frosts stop their vegetation. They are therefore preferable to every other sort: but if there be any difference, in point of goodness, between the scarlet and the large white, it is in favour of the former; because it's pods are seldom stringy at any time. They also boil greener, and are better tasted, even when old, than the young pods of the early kinds of this plant.

These largest sorts of kidney-beans should be planted six or eight, or even more inches asunder, in rows at least four feet distant from each other: for as they grow very tall, the sun and air will otherwise be excluded from the middle rows. This will also leave very sufficient room for stirring of the earth between them according to the principles of the new husbandry, by observing of which we have already seen<sup>o</sup> that M. Eyma, one of M. Duhamel's, correspondents, had not only a much greater crop of these beans, than any that were raised in the common way; but likewise much finer than he had ever seen before. When these plants are about four inches high, poles eight or ten feet long should be thrust into the ground by the side of them: for they will twirl themselves around them, quite up to their top, and produce plenty of fruit from the ground upward.

<sup>o</sup> See Vol. II. p. 376 and 377.



To save the best seeds of these plants, a few of the finest rows of them should be left ungathered during the whole season: for the latter pods never are so long and handsome as the first growths, nor do they yield equally good seed. When they are ripe, the plants should be pulled up in a dry season, and spread abroad in the sun, to dry: their beans should then be threshed out, and kept in a dry place.

The Germans, French, Dutch, and Flemish, preserve great quantities of the large white Dutch kidney-beans, dry, for winter use. They stew them, and cook them so as to make a tolerably good and heartening dish. It is a principal part of the food of the common people in Roman Catholic countries, during Lent.

*Lentils*, or *Tills*, as they are frequently called in many parts of England, are also a considerable, and not bad, lenten food. The best times for sowing them are, March for dry land, and April for wet. They succeed best when sown in drills, in the same manner as is practised for peas, and their increase will be prodigious on a middling, or rather poorish soil: for they will grow so luxuriant in rich land, that they will not seed well. The rows should be sufficiently distant to admit of hoeing between them, as well to stir the ground, as to keep the plants clear from weeds: for though lentils are hardy enough in other respects, as are all kinds of the vetch, of which this is a species, they would be starved if many weeds were to get above them, as they might soon do if these plants, the common sort of which seldom rises above a foot and an half high, were to be neglected for any length of time. The French lentil is twice as big as the common sort, both in plant and seed. Lentils, when ripe, are reaped, threshed out, and preserved for use, in the same manner as peas.

Their



Their pods seldom contain more than two or three seeds. These seeds are round, smooth, and flat, but thicker in the middle than at the sides; and they will become exceedingly hard, if they are kept long in a dry place. The white lentil is most esteemed for the food of men; the yellow being cultivated chiefly for cattle, and consequently in the field, in which light this plant has been treated of in my first volume<sup>p</sup>.

*Peas* grow quickest and largest in the richest mould, but a more ordinary soil yields the tenderest and sweetest. The best manner of sowing them is in drills, sufficiently distant to afford proper room for hoeing, digging, or otherwise stirring the ground between them: for we have already seen<sup>q</sup> how very much these plants are benefited by being managed according to the principles of the new husbandry, which should therefore with these, as with all other vegetables, be practised with a spade, where a plough, or horse-hoe cannot be used. The distance between the rows of peas should therefore be proportioned to the size to which they grow. The channels in which they are sown should be about two inches deep; and the quickest and most regular way to perform this work is, to draw a small hoe, directed by a line, along the surface of the ground, so as to open a drill, then to scatter the seeds in this furrow, and to earth them over with the help of a rake. By this means they will be well and equally covered; which is essentially necessary, because if any of them lie above ground, they will attract, mice, rooks, pigeons, and other birds, which will then soon find out the rest, and destroy the whole plantation. The chief trouble after sowing them is, to stick

<sup>p</sup> See p. 481.

<sup>q</sup> Vol. I. p. 471, 472. and Vol. II. p. 375-376.



the larger sorts which require support, to keep the plants clear from weeds, and to earth them up; both which last parts of their culture are very easily, readily, and effectually executed, when a small plough can be introduced between the rows.

The names of the principal sorts of garden peas now cultivated in England, and the order in which they naturally become fit for gathering, are as follow, *viz.* the golden Hotspur, the Charlton Hotspur, the Reading Hotspur, the Master's Hotspur, the Essex Hotspur, the Dwarf pea, the Sugar pea, the Spanish Morotto, the Nonpareil, the Sugar Dwarf, the Sickle pea, the Marrowfat, and the Rose, or Crown pea: for the Rouncival, the common white pea, the gray pea, the pig pea, and some other large winter peas, as they are commonly called, seldom find a place but in the field, where their most proper management has been directed in my first volume\*. But I must here observe, that several of the abovementioned, which gardeners and seed-men have distinguished by different appellations, are, in fact, only seminal variations, which will degenerate into their original state in a few years, if they are not very carefully managed. The only way to prevent this, is to *rogue* them, as the gardeners term it, that is to say, to examine attentively those which are intended for seeds, at the time of their beginning to flower (but before the flowers are open), and to draw out all the bad plants from among the good ones, that the farina of the former may not impregnate the latter, and thereby make them change. It is chiefly owing to this particular care, and to the selecting of those plants which blossom earliest, that the culture of peas has been very

\* See p. 464—473.



greatly improved of late years around this metropolis, and that, from a continuation of the same industrious endeavours to bring it to still greater perfection, we may hope to see yet forwarder varieties of this most useful species of pulse.

The Hotspur pea is, naturally, the earliest of all, and therefore I have named it first: but the gardeners about London raise, by art, from the dwarf pea, transplanted into a hot-bed, a crop which anticipates the spontaneous growth of the other. To effect this, they sow their dwarf peas in warm borders, under walls or hedges, about the middle of October; and when the plants are risen, they draw the earth up gently around their stems, to protect them from the frost. They let them remain where they were sown till the latter end of January, or the beginning of February (still continuing to earth them up from time to time, as they advance in growth, and covering them with dry haulm, or straw, in case of severe frost), and then remove them into a hot-bed made of good, new, well fermenting dung, properly mixed, that the heat may not be too great. This dung is laid from two to three feet thick, according as the season is more or less advanced; it is covered with six or eight inches deep of light and fresh, but not too rich, earth; the frames, about two feet high at their back, and fourteen inches deep in front, are then put on, and covered with their glasses, which are propped up every day, during three or four days, to let the rising steam pass off; and when the bed is become of a moderate temperature, the plants are taken up as carefully as possible, to preserve the earth about their roots, and planted in it about an inch asunder in rows two feet distant from each other. They are then watered a little and shaded, till they have taken root, and aired whenever the season is favourable, lest they should be drawn up very weak, grow mouldy,



mouldy, and decay. Their stems are also earthed up as they advance in height, and they are kept perfectly clear from weeds. This first watering should be gentle, and dealt out sparingly; for too much of it would make them grow rank, and sometimes rot them off at their shanks, just above the ground. If the weather becomes very hot, the glasses are covered with mats in the day time, to screen the plants from the too great violence of the sun; and when they begin to fruit, they are watered oftener and more copiously than before; for they have nearly done growing by that time, and refreshing of them frequently will make them produce the greater number of pods.

The dwarf pea is preferred for this purpose, because it is more easily confined within frames, than any other sort. The reason for sowing it in the common ground, and afterwards transplanting it into a hot-bed, is, to check it's growth, and thereby make it bear the more in a smaller compass.

The Hotspur, of which the sorts before enumerated differ very little from each other, except in the forwardness of their fruit, in which the golden and the Charlton are earliest, succeeds the hot bed crop of the dwarf pea. But it is necessary to observe here, that both these kinds of hotspur peas are particularly apt to degenerate, and become later in their podding, if they are cultivated in the same ground for three or four years running: wherefore the best way is to change their seeds annually, and always to prefer such as come from a colder situation and a poorer soil, than the place where they are to be sown, for these will be earliest in the spring; and if they are procured from a distant part, it will be so much the better.

These peas must also be sown in warm borders, about a fortnight after the former, that is to say,  
towards



towards the end of October. When the plants are a few inches high, they should be earthed up as before directed, to defend their stems from frost; and if the winter be very severe, they should be covered with haulm, or some other light covering: but this must be taken off as soon as the weather grows mild, lest it should draw them up weak and tender; and the weeding and earthing up should be repeated as they advance in growth, but with care not to bury their leaves, for that might rot their stems, especially in wet seasons. Both of these works must be very carefully performed in the spring: and this is likewise the most proper time to kill the slugs, which, of all vermin, do the greatest injury to peas. They lie all day in the hollows of the earth, near the stems of the plants, and come out in the night, to the sometimes total ruin of the crop: They abound most in wet soils, and in neglected grounds over-run with weeds: for which reason they have the least chance of finding shelter where the new husbandry is well practised. Mr. Miller recommends<sup>s</sup>, as the best method he could ever find to destroy them, to clear the ground thoroughly well around the plants, and there, very early in a fine mild morning, when these insects are got abroad, to slake a quantity of lime and strew it over the ground hot, and pretty thick. This will kill the slugs wherever it falls upon them, and will not do much hurt to the peas, if they be not over-loaded with it.

If this crop does well, it will immediately succeed that of the dwarf peas on the hot-bed: but lest it should miscarry, it will be right to sow two other crops, at the distance of about a fortnight or three weeks from each other. These will

<sup>s</sup> *Gardener's Dict.* Art. PISUM.



suffice till the spring, when more crops of the same sort may be sown every fortnight, and by this means the early peas will be continued through the season.

About the middle of February, some of the Spanish Morotto, which is a great bearer, and a hardy pea, may be sown in a clear open spot of ground, for the next use of the family. The rows of these, which are a larger kind, should be four feet asunder, and the peas should be dropped at about an inch from each other in the drills.

To succeed these, another spot of ground should be sown about the end of February, either with the same, or any other large sort of pea, and these sowings should be continued every fortnight, till the middle or latter end of May; only observing to allow distances proportioned to the size of the pea at it's full growth. Thus marrow-fats, for example, should not stand nearer than four feet and an half from row to row, and the rose pea should be at least eight or ten inches asunder in the rows: for all peas, (and the case is exactly the same in regard to every other plant) will run up in height, and yield but little fruit, if they are too much crowded.

When these larger sorts of peas (which must be carefully weeded and earthed up as before directed) are grown about eight or ten inches high, some brush-wood should be stuck up close to them, to prevent their trailing upon the ground, which is very apt to rot these kinds in particular, especially in wet seasons: and another great advantage arising from their being thus supported, is that the air has then a free current between them, which will keep their blossoms from falling off before their time, and they will consequently bear much better than they could if left trailing upon the ground. There will also, by this means, be  
proper



proper room to hoe between the rows, and to pass between them in order to gather the peas when they are ripe.

The marrowfat is the best tasted of all the large kinds of peas, and it will continue good till the end of August, if it be planted in a strong soil. The other large growing sorts may be raised for the common use of the family, because they yield the most plentifully, and can endure the greatest drought: but the early kinds are by far the sweetest. It will therefore be well worth the master's while to see that a crop of these, and particularly of the early hotspur, is sown every fortnight, to supply at least his own table during the season.

All the dwarf peas yield plentifully, if the weather be not over dry; but they seldom continue to bear long. As they rarely surpass the height of one foot, or spread wider than six inches, about two feet and an half may be a sufficient space for weeding and stirring of the ground between their rows, in which they need not be set above an inch asunder. Among these may be classed the Sickle pea, or Sugar pea, which is much cultivated in several foreign countries, but is seldom propagated here, except by curious gentlemen, for their own table. The pods of this pea, are crooked and ill-shaped, but extremely sweet when boiled with their unripe fruit in them, as is the general way of dressing them; for they have not any tough inside skin, like the pods of other peas. I wonder that this sort is not yet to be met with in our markets; unless the reason be, that the trading gardeners, who furnish them, find that their profit will not pay for the trouble and expence of defending these peas from birds, which are so excessively fond of them, that they will soon devour a whole crop, if they are not  
very



very carefully kept off. If these peas are planted in April, they will be fit for gathering at Midsommer. Their pods, when they are very young, and their tendrils, have an agreeable acid flavour in sallets; as have also the young tendrils of the hop and the vine.

A general rule to be observed in the planting of peas, is that the later they are sown, the stronger and moister the soil should be.

#### A R T I C L E IV.

##### *Of Salleting.*

**C**HERVIL (*the Garden*) is an annual plant, raised only from it's seeds, which are black, very small, and longish, and streaked lengthwise. It will thrive in any soil or situation, and may be sown either in drills, or broad cast; but the former of these methods is the best, because it greatly facilitates the weeding and cutting of the plants, whose culture is in all respects the same as that of the common parsley. The best time to sow chervil is in the autumn, soon after it's seeds are ripe; for they grow best then, and the plants which rise in that season continue green all the winter; whereas, those which are sown in the spring seldom come up at all; or if they do, their plants, are almost sure to wither and decay, as soon as the warm weather sets in. The plants of the autumnal sowing flower in April, perfect their seeds soon after, and then die away. To save these seeds properly, their stalks should be cut down when they begin to grow yellow.

Those who are fond of this plant, as many are in soups in the winter and spring, may have a succession of it very young, by sowing it monthly during



## THE KITCHEN GARDEN. III

during the season : but whoever uses it, should be cautious not to mistake the leaves of the annual *myrrhis* \*, for this, as some of the Dutch soldiers who were in England in the year 1745 did, and were poisoned thereby ; and as happened since to the late Dr. Schomberg, through the ignorance or inattention of his cook. That excellent physician indeed, cured himself.

\* It is proper here to give Mr. Miller's description of the two species of this noxious planta.

“ The *Chærophyllum flosculis omnibus fertilibus, caule æquali*, of Dr. Linnæus, *Sp. Plant.* 258. Chervil whose flowers are all fertile, and it's stalks equal ; which is the *Myrrhis sylvestris seminibus lævibus* of C. Bauhin, *P.* 160. Wild Myrrh with smooth seeds ; grows naturally on the side of high-ways, and the borders of fields in most parts of England. It is frequently called cow-parsley, but for what reason I cannot say, because there are few animals who care to eat it, except the ass, for it is reckoned to have something of the quality of Hemlock, but in a less degree. It is a weed which should be rooted out from all pastures early in the spring, for it is one of the most early plants in shooting, so that by the beginning of April it's leaves are near two feet high. The seeds of this plant spread greatly over the ground, and as the roots are perennial, so they are often very troublesome weeds to destroy”.

I mention this sort of the wild myrrh chiefly as a caution to husbandmen : for the following is the species most apt to be fatally mistaken for chervil.

This is Linnæus's “ *Chærophyllum caule lævi, geniculis tumidis*, *Sp. Plant.* 258. Chervil with a smooth stalk, and swelling knots ; and the *Myrrhis tuberosa et nodosa conyophillon*, *Mor. Umb.* 67, Tuberous and knotted Myrrh with a hemlock leaf. It grows naturally in Hungary and Istria, and has a thick tuberous root, from which come forth several leaves, resembling those of wild chervil, which spread horizontally near the ground. The stalks rise six or seven feet high, and are spotted with purple, and garnished with leaves of the same form as those below. The knots at the joints of the stalks swell out on every side, at which is placed one of these divided leaves, and the stalks are terminated by small umbels of white flowers, which are succeeded by long narrow seeds. It flowers in June, and the seeds ripen in August.

a *Gardener's Dict.* Art. CHÆROPHYLLUM.

*Ciboules*



*Ciboules* are propagated only by seeds, which, if sown in March, will be ripe in August; and these are reckoned the best for saving: but they may be sown in almost all seasons. They differ from the onions, of which they are probably a degeneracy, in that they do not form bulbs at their roots, but shoot out several upright blades, and those which produce the most of these are reckoned the best. Their culture is the same as that of onions, like which they must be thinned and well weeded. They will increase greatly, even in very dry summers, if they have been transplanted into beds of good earth, and those beds well watered. The reddest, hardest, and mildest are the most esteemed. Their peculiar quality is that of creating an appetite.

Mr. Miller, who has planted several times *ciboules* which he received from abroad, never found them differ from what is generally known here by the name of Welch onions: and for this very good reason he supposes them to be the same, though they pass under different appellations<sup>t</sup>.

*Cives* thrive best in a light rich ground. They are propagated by parting their roots, which never become bulbs, and the best time for setting them is in March: though they may be transplanted in the autumn, for they are very hardy; and in this case they will produce blades fit for use early in the spring. It is for these blades only, which seldom grow above six inches high, and are very small and slender, that they are cultivated. They were formerly in great request for mixing with sallots in the spring, because they are milder than the *ciboule*, or Welch onion. In good ground, they will last three or four years, without removing, or any other trouble than loosening the earth

<sup>t</sup> *Gardener's Dict.* Art. *CEPA*.



around them now and then, keeping them clear from weeds, and perhaps watering them a little sometimes in great droughts.

*Clary*, is propagated by seeds sown in the spring, in good garden mould. When the plants are fit to remove, they should be transplanted into beds, and there set at least one foot asunder. If they are planted in more rows than one, it should be on an open spot of ground, at the same distance from each other, and with a space of at least two feet between the rows. After they have taken root, keeping them clear from weeds is the only farther culture usually bestowed upon them: but good stirring of the ground around them will greatly add to their increase. In the winter and spring following, their leaves, which are the only part used, will be fit for gathering; and in the ensuing summer, they will flower, seed, and decay; so that a succession of young plants should be raised every year. The common manner of cooking the leaves of clary, is to dip them in butter, and fry them. They are reckoned a great restorative. It is with the flowers of one of the species of this plant †, that the Dutch give a flavour to the Rhenish wines which are brewed at Dort.

*Cresses* are of various kinds: but the common Garden Cress, the Indian Cress, and the Water Cress, are the sorts used for the table.

The common garden cress, pretty generally cultivated as a sallet herb, is most esteemed in the

† *Viz.* Of the *Sclarea foliis cordato-sagittatis serratis acutis*, Clary with heart-shaped crenated leaves, which are acutely sawed. — Our common garden Clary, originally a native of Syria, is the *Sclarea foliis rugosis oblongo cordatis serratis, floribus calyce longioribus concavis acuminatis*, Clary with rough, oblong, heart-shaped, sawed leaves, those among the flowers concave, pointed, and longer than the empalement. MILLER'S *Gardener's Dict.* ART. SCLAREA.



winter and spring, because it is one of the warm kind. It is propagated by it's seeds only. If raised in the winter season, it must be sown upon a gentle hot-bed, and covered so as to defend it from great rains or frost, both of which are equally destructive to it in that season. If it be not raised till the spring, it may then be sown in warm borders, well fenced from all nipping winds: but if it is to be continued in the summer, it must be sown upon shady borders; and this sowing should be repeated every third day, or it will soon be too large for use, as it grows very fast at that time of the year\*.

A curled sort of this plant is propagated in some gardens, more for curiosity, and to garnish dishes, than for any real use; for the common sort is full as good. This curled cress should not be sown quite so thick as the other, and when it's plants are come up, they should be thinned, so as to leave the remaining ones at least half an inch asunder, that they may have room to expand their leaves. To preserve this curled variety unmixed, all such plants of it as seem to have a tendency to degenerate must be pulled up as soon as they are noticed.

The best method of sowing both these sorts of cresses is in drills, because it will then be easiest to cut them as they may be wanted. Their seeds, which are very small, should be but barely covered with earth; and to save these seeds when they are ripe, the plants should be drawn up, spread upon a cloth, and dried in the sun for two or three days. They may then be easily beaten out; and they should be kept in a dry place.

\* Mr. Mortimer says b, that cresses sown about the middle of August, in natural ground, will resist the frost, and be fit for winter salleting.

b *Art of Husbandry*, Vol. II. p. 154.



The *Indian Cress* (commonly called *Nasturtium*, which is the right botanic name of the garden cress, as *Tropæolum* is the proper appellation of this,) is an annual plant, seldom propagated otherwise than by it's seeds; thought it may be continued through the winter, if kept in pots, and sheltered in a good green house, and there it may be multiplied by cuttings, as is sometimes practised with the double flowered sort. But this is not worth while, as the seeds ripen every year, and plants are easily raised from them. They are often raised in hot-beds about the end of March or the beginning of April, and then transplanted: but they may be sown in April, in the places where they are to remain. This, for the sake of ornament, and that no small one in a kitchen garden, should be where their stalks may find support, for they will climb up to the height of six or eight feet, and make a very pretty appearance when their flowers are blown. Those of a deep orange colour, inclining to red, are less common now, in this country, than the larger sort with a pale yellow flower; this last being generally preferred on account of it's size. These flowers have a warm taste like the garden cress. They are commonly used for garnishing of dishes, and are frequently eaten in sallets. Their seeds fall off as soon as they are ripe, and are excellent when pickled. Some call them Capuchin capers.

The *Water Cress*, which grows naturally in ditches and rills of water in most parts of England, is much esteemed as a sallet herb in the spring of the year. Many people even prefer it to all other salleting of that season, for it's agreeable warm bitter taste, and because it is reckoned an excellent anti-scorbutic, a great cleanser of the blood, and a good diuretic. The Editor of the

last edition of Mr. Mortimer's husbandry says<sup>v</sup> that water cresses, fresh gathered and eat fasting in in a morning, have performed wonders in consumptive cases; and he judiciously recommends to sportsmen, or others, who stay long in the fields in cold weather, to gather them out of the springs where they grow, and eat them, as a better cordial to warm the stomach, than any dram of spirituous liquors.

Water cresses are easily cultivated, by taking some of the plants, entire, from the place of their natural growth, early in the spring, with all their roots to them, then setting them in mud, and letting water in upon them by degrees, so as at length to form a kind of pond, if it cannot be continued as a running stream; though few spacious grounds are without some brook or other, along the sides of which they will grow perfectly well. After they have taken root, they will soon multiply, especially if they be not cut the first season, but suffered to ripen their seeds; for these will fall into the water, and afterwards afford a sufficient supply of plants. If the water is too deep to admit of planting them with ease, and if it be not a running stream, the best way is to throw upon it's surface, at the places where it is desired they should grow, some of the plants taken from elsewhere just as their seeds are coming to maturity: for they will there complete their ripening, sink to the bottom, and produce a plentiful growth of cresses.

Incautious persons have, not unfrequently, suffered in their health, by eating the leaves of the creeping water parsnep, instead of those of the water cress. To guard against this mistake, which may chance to prove fatal, it is proper to observe,

<sup>v</sup> Vol. II. p. 153.



that the leaves of the right water cress are roundish, almost heart-shaped, small, with few indentures on their edges, and of a dark green colour; whereas those of the water parsnep are oblong, pretty sharp pointed, sawed at their edges, and of a light green colour.

*Dandelion*, of which there are four or five species, grows naturally in the fields, where it is looked upon as a very troublesome weed. If it's roots are planted in a spot of garden ground, and there blanch'd, by being earthed up, they will yield pretty long and tender shoots, which some people are fond of, as a sallit, on account of their agreeable bitter taste: but if they are suffered to perfect their seeds, which are light, downy, and of course easily blown about by the wind, they will soon spread to a much greater distance than may be desired.

*Endive*, or *Succory*, is propagated by it's seeds only, which are longish, flat at one end, and roundish at the other, not unlike to little bits of small stalks. Those of the white, the green, and the curled, which are the sorts cultivated in the kitchen garden, are of a whitish grey colour. The seeds of the wild succory, which is used for medicinal purposes, are black, but of the same shape as the former. All the sorts of endive are esteem'd aperitive and diuretic. They will grow in almost any soil, but thrive by far the best in deep, good, and well loosened mould. The management of each sort is the same.

The curled endive is the sort now most cultivated in England for sallits in the autumn and winter, during which it may be continued in perfection, so long as the season will permit, by observing the following directions.

The first sowing of endive should be about the middle of June; for that which is sown earlier



is apt to run up to seed, especially if the ground be rich, and the situation warm, before the plants have arrived to a proper size for blanching. The second sowing should be in the beginning of July, and the third and last about the middle of the same month. The plants of each of these sowings will be so very different in their growth, that each bed will afford a succession of two or three crops, and the three sowings will of course furnish an uninterrupted supply during the whole season.

The plants must be well weeded, and frequently watered in dry weather, till they are fit to transplant. A spot of rich ground, proportioned to the number of plants intended to be set in it, should then be prepared for them, by thorough digging, and laying of it's surface smooth; and, if it be very dry, it must be well watered. The largest plants should be removed first from the seed bed, and the smaller ones should be left there to gather strength, which they will soon do after the additional room for their farther growth, so as, in their turns, to be fit also for transplanting. Care must be taken not to break their roots in drawing them up from the seed bed; and if the tops of their leaves are shortened then to nearly equal lengths, and they are spread with all their roots turned the same way, these little precautions will render the regular planting of them much easier, than when their heads and tails are jumbled promiscuously together. They should be transplanted in rows at least one foot asunder, and set ten inches apart in the rows. The earth should be well closed around their roots, and they should be well watered every other evening till they have taken good root, after which they must be kept clear from weeds.



If the plants left in the seed bed are also well weeded and watered, a second transplantation may be made from thence in about ten days or a fortnight after the first, and the remainder of them will be fit to transplant, in the same manner as before, at about the same farther distance of time.

The plants that were first transplanted will be fit for blanching by the latter end of August at farthest. To do this properly, the gardener should grasp in one hand all the inner leaves of the plant, in regular order, and then collect over them the outside sound ones; for the rotten and decayed leaves, which lie next to the ground, should be pulled off and thrown away. The leaves thus gathered up should be placed as nearly as can be in the natural order of their growth, so as not to cross one another; and when the whole plant is thus collected, it should be tied up very close with a twig of osier, or a strong slip of bask matt, at about two inches below the top. This should be done in a very dry afternoon, when the middle of the plants is perfectly free from dew or rain: for any such moisture tied up in them, would soon make them rot. In about a week after this, these plants should be tied again round the middle, to prevent their heart leaves from bursting out on one side, which they are otherwise apt to do, as they increase in bulk; and with this management they will be quite blanched in three weeks or a month, from the time of the first tying up. The largest plants should always be tied up first; so that by going over the same ground once a week, and taking them according to their size, the crop will be continued longer than if they were all tied up at once: for they will not hold sound and good above ten days or a fortnight after their blanching has been completed, especially if the season prove wet. For this reason it is most advisable to sow

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and plant at different times, as before directed. But it is to be observed, that all the plants of the last sowing should be transplanted under pales, walls, or hedges, to screen them from frost; and if the winter be severe, they should also be covered with peas-haulm, or some other light covering, which should be carefully taken off in mild weather: and these borders must likewise be as dry as possible; for endive is very liable to rot, if planted in moist ground in the winter.

Only the plants of the two first sowings are to be tied up in order to blanch them: for, after October, when the nights begin to be frosty, the plants of the late crop would be in great danger of being killed thereby, if they were to be left entirely above ground, even though they should be covered with haulm. The best way of managing these, is to take them up in a very dry day, and with a large flat pointed dibble, plant them in the sides of ridges of earth laid very upright, facing the sun, with only the tops of the plants out of the ground. The plants thus situated will be exposed to as little wet as possible, for rain cannot then lodge upon them, and in about three weeks or a month's time they will be blanched fit for use: but they will not keep good long after that. Fresh ones should therefore be planted in this manner every week or fortnight at farthest, by those who would have a constant supply for the table; and if those which were transplanted from the seed beds are kept till February or March, before they are thus set to blanch, sallets of endive may be had regularly till the beginning of April, or later. This last planting will continue good longer than that which was made just before the beginning of winter; because, as the days increase in length, the sun grows warmer, and the too great moisture of the earth, which  
would



would endanger the rotting of the plants, is more and more exhaled.

When the endive, blanched either way, is fit for use, it should be dug up with a spade, and after all it's outside green and decayed leaves have been stripped off, it should be thoroughly washed in two or three different waters, to clear it from slugs and other vermin which commonly shelter themselves among it's leaves.

If any of the plants should put out flower stems either before or during the time of their blanching, they should be immediately pulled up, and thrown away.

In order to have good seeds of endive for the next season, some of the largest soundest, and most curled plants (a dozen of such will yield seeds enough for any middling family) should be chosen from among the borders where the last crop was transplanted, before the rest of it is put into the ridges to blanch. These selected plants should be carefully taken up, in the beginning of March, if the weather is mild, (otherwise it may be deferred a fortnight longer), and transplanted into a well sheltered place, at the distance of about eighteen inches asunder, in one row, which should be placed pretty near to the fence, whether it be wall, pale, or hedge; but not too near, especially if it be the former, because the danger of frosts and nipping winds is greatest quite close to a wall\*. These plants should be kept very clear from weeds, a deep stirring or two of the earth will give them great vigour, and when their stems begin to advance in height, they should be supported by a string run along before them, and fastened at each end, either to the fence, or to stakes set up for this purpose. About the beginning of

\* See p. 20.



July, these seeds will begin to ripen. As soon as they are quite ripe, the stalks must be cut off, and spread upon a coarse cloth, to dry in the sun. They should then be beaten out, dried again in the sun, and laid up in bags, or paper, in a dry place. But a circumstance of some moment here is, that it would be wrong to wait for the ripening of all the seeds of the same plant, because, such is their irregularity in this respect, the first ripe and best of the seeds will scatter and be lost, before the others are near ripe.

*Escallion.* See *Scallion*.

*Lettuces* of all kinds are multiplied only by their seeds, which they produce the first year, and then die, if they have not been transplanted. The sorts generally cultivated in the kitchen garden are, the common, or garden lettuce, the cabbage lettuce, Cilicia lettuce, the brown Dutch lettuce, the Aleppo lettuce, the Imperial lettuce, the green Capuchin lettuce, the Versailles, or upright white Cos lettuce, the black Cos, the red Cos, the red Capuchin lettuce, the Roman lettuce, the Prince lettuce, the Royal lettuce, and the Egyptian Cos lettuce.

The first of these is most commonly sown for very early use, to mix with other small sallet herbs. It is only a degeneracy of the cabbage lettuce, or this last is an improvement of it by repeated good culture; for the seeds of cabbage lettuces which have not cabbaged closely will produce the former sort, which gardeners distinguish particularly by the name of lapped lettuce. These may be sown at any time of the year, only observing, to choose shady borders in hot weather, warm situations in the spring and autumn, and to sow under glasses in the winter, because severe frosts would kill the young plants.

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The cabbage lettuce is likewise sown at several different times, in order to have a supply of it throughout the season. The first crop of this is generally sown in February, upon an open warm spot of ground. When the plants are come up, they should be thinned to the distance of about ten inches asunder every way, either by hoeing them, if their superfluous numbers be not wanted, or by drawing them up by hand where they stand too close, and transplanting those which are thus removed into other good mould, likewise at the distance of about ten inches from each other. If this is done before the plants are too large, they will thrive well; though the transplanted ones will seldom grow so big as those which were not removed: but, in return, they will come somewhat later, and thereby answer the purpose of those who do not repeat this sowing every fortnight.

In proportion to the advance of the season, the subsequent crops should be sown in a more shady and moist situation, but by no means under the drip of trees, lest the plants should run up to seed before they cabbage, especially in the heat of summer. The last crop of these lettuces, which are to stand all the winter, should be sown by the middle of August, pretty thin, upon a good light soil, warmly situated; and when the plants are come up, they must be well weeded, and thinned, by hoeing, so that they may not touch each other. The beginning of October will be a proper time for transplanting them into warm borders, where they will resist the winter, if it be not very severe: but, to guard against it's inclemency, and thereby be sure of a crop, it will be advisable to transplant some of this growth into a bed which may be arched over with hoops, and covered with mats, straw, or peas haulm, in hard weather. They  
may



may be set pretty close together; and if they are re-transplanted in the spring, into a warm and rich soil, at the distance before mentioned, they will do very well; though they will not cabbage so soon as those which may have been left un-removed under a warm wall, if these last escape the winter, and if the necessary caution has been observed, of not placing them too close to the wall; for this situation would make them run up in height, and consequently prevent their growing large or hard.

To have good seeds of this sort of lettuce, the plants should be looked over when they are in perfection, and the largest, hardest, and lowest growing of them should be marked out by sticks thrust into the ground close to them. All the rest should be carefully rooted out as soon as they begin to run up, lest the farina of the flowers of these inferior ones should intermix with the others, and thereby occasion a degeneracy of their seeds.

The beginning of February is also the first season for sowing the Cilicia, the Imperial, the several kinds of Cos, and the other sorts of lettuces above mentioned: but this early sowing should be upon a gentle hot-bed covered with a frame. The second season, for these, is the latter end of February, or beginning of March, upon a border of light earth, and in a warm exposure, and open situation, that is to say, in a situation not shadowed by trees. When the plants come up on the hot-bed, plenty of fresh air should be admitted to them, to prevent their being drawn up weak; and when they have got five or six leaves, they should be transplanted into another hot-bed, to bring them forward: but this last need only be arched over with hoops, and covered with mats; for they should not be kept too warm there. When they are removed from thence, and planted



out for good, which should be as soon as they are strong enough to bear it, they should be set sixteen inches asunder every way, in a well loosened spot of fine good earth. Those which were sown in the warm borders should also be transplanted into a similar spot, and set at the same distances as the former. If the season is dry, care should be taken to water both the one and the other till they have taken root, and then to keep them constantly clear from weeds. This is the only culture that any of them will require, except the black Cos lettuces, which should be tied up when they are full grown (in the manner before directed for blanching of endive) to whiten their inner leaves, and render them crisp; for they seldom cabbage well without this assistance.

To continue these lettuces through the season, other crops of them must be sown in April, May, and June; observing, for the reasons before given, to sow the latest in the most shady situation. Towards the middle or latter end of September, should be the last sowing, and the plants produced thereby should be transplanted, either under glasses, or into a bed arched over with hoops and covered in the winter, to prevent their being destroyed by the frost: but as much free air as possible should be admitted to them when the weather is mild, and they should be covered only in hard rains, or when it freezes; for if they are too closely covered they will grow mouldy, and soon after rot. — In the spring, they should be removed into a rich light soil, and there set at least eighteen inches asunder every way: for if they are planted too close, they will be apt to run up in height, and not to cabbage well.

This is the crop from which it will generally be most proper to save the seeds of these lettuces, if they succeed well: though it will be right also to  
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mark out some of the finest plants of the crop sown in the spring ; because those of this last sowing may sometimes fail, through the wetness of the season, even when they are in full bloom, and the others may do well by having more favourable weather : but if both should succeed, there will be no room for complaint, since the seeds of lettuces will grow perfectly well after they are two years old, and, if they have been saved with due care, even at the end of three years. Very great caution should be used here, not to let any of the common sorts seed among or near these more valuable plants ; not only for the reasons before assigned, but because they are naturally the most apt to degenerate in this country. The best way therefore is to keep the plants of each sort which are intended for seed, as separate as possible from all others ; and to suffer none of them to perfect their seeds, except such as are entirely approved of.

The Egyptian green Cos, the white Cos, the Cilicia, and the red Cos, are the most valuable of all the sorts of lettuce cultivated in England. The royal and imperial lettuces are very good ; but not so generally esteemed. The white cos used to be preferred to all others, till of late years, that the Egytian green cos, and the red cos, have been found to be by far the sweetest and tenderest. These will endure the common cold of our winters full as well as the white cos : but they are more apt to rot, if the season of their cabbaging be very rainy.

The green Capuchin and the brown Dutch lettuces are very hardy sorts, and may be sown at the same seasons as the common cabbage lettuce. They are very proper to plant under a hedge, or other fence, to stand the winter ; because they will often live there, when most of the other sorts are destroyed.



destroyed. They will also bear more heat and drought, and therefore are very fit for late sowing: nor do they run up to seed so soon as the other sorts, after they are cabbaged. If some of them are planted upon a gentle hot-bed in autumn, and well covered with a frame, they will cabbage so as to be fit for use in February and March, and may be continued till those in the open air are ready for the table. All these qualities render them valuable: especially as, in consequence thereof, these may be had at a time when there are but few others. To prevent their degenerating, none but the largest and best cabbaged of these plants should be set apart for seed; and all the cautions before given in this respect should be strictly observed here.

Besides the general rule before mentioned, of not suffering two different sorts of lettuces ever to stand near each other when they blossom, lest the mixing of their farina should make both of them vary from their original, and partake of each other; it is necessary, especially for those which run up high, such, in particular, as the Cilicia, the Cos, and the other large growing sorts, to thrust down by the side of each, a stake to which it's stem should be tied, to prevent it's being broken, or blown out of the ground by wind. The seed branches should be cut as fast as the seeds ripen, without waiting to have the seed of the whole plant together; for there will frequently be a fortnight or three weeks difference between the ripening of one part and that of another; and when they are cut, they must be spread upon a coarse cloth, in a sunny place, to dry the seeds yet more. The seeds should then be beaten or rubbed out, dried again in the sun, and afterwards laid up in a dry place, where neither mice nor other

other vermin can get at them; for if they do, they will soon eat them up.

*Mustard* is an annual plant, raised from it's seed only. The white mustard, as it is commonly called, is the sort chiefly cultivated in gardens, for a sallit herb in the winter and spring. The seeds of this are sown very thick in drills, either upon a border warmly situated, or if the weather be very cold, upon a gentle hot-bed, in the same manner as cresses and other small sallitings, and in about ten days or a fortnight after the time of sowing, the plants will be fit for use; for when they are large and have rough leaves, they are too strong to be mixed with sallits.

The best way to save the seeds of this plant, is to sow a spot of ground with it in the spring, to thin the plants when they have about four leaves, and at the same time to hoe down the weeds, as is practised for turneps. This hoeing is to be repeated in about a month after, and the plants are then to be left about eight or nine inches asunder, which will be a sufficient space for the growth of this species. If these hoeings are well performed, in dry weather, they will keep the ground clean till the mustard seeds are ripe. The stalks of this plant, which are branched and hairy, will then be about two feet high, and the ripening of it's seed is indicated by the pods changing to a brown colour; immediately after which they should be cut down, dried upon cloths, for two or three days, and then threshed out for use.

The larger sorts of mustard, the seeds of which are used chiefly for sauce, are to be treated in the same manner; excepting that, as they grow much larger, a proportionably greater space must be left between their plants; and as their seeds will not ripen so soon as those of the smaller kind, three hoeings, or rather good deep stirrings, of the ground



ground may be requisite for them. One of these larger sorts, which is the common mustard, grows naturally in very many parts of England, but is cultivated in the fields for it's seeds, of which the sauce called mustard is made; and another sort, which likewise grows naturally in our arable lands, and is also cultivated for use, produces the seeds which are commonly sold under the appellation of Durham mustard seed. The stalks of this last sort seldom raise above two feet high: but those of the former generally run up to the height of four or five feet.

*Nasturtium*. See *Cresses* (*Indian*).

*Rape* seeds are frequently sown in drills in the kitchen garden, in the same manner as cresses and mustard, like which they sprout in a few days, and the plants produced from them, being also of the warm kind, are mixed with winter and spring sallots, when they are very young. The farther culture of this genus of plants does not belong to the present subject, and has already been treated of<sup>y</sup>,

*Scallions*, or *Escallions*, are a sort of onion whose root never becomes a bulb. They are used chiefly in the spring in lieu of green onions, and were formerly much more common than at present; for they are now so scarce as hardly to be met with. The gardeners near London have a trick of substituting in their stead onions which, after they have decayed and sprouted in the house, they plant early in the spring in a bed where they soon grow large enough for their purpose, which is, then to pull off all the outer coat of the root, to tie them up in bunches, and to sell them in the market for scallions: but, which cannot be done with these, the root of the true scallion is easily parted, and it is by setting of their slips, either in the spring or autumn,

<sup>y</sup> See *Vol. III. p. 197.*



that this plant is propagated. The autumn is the best time, because the scallions transplanted then will be fittest for use the next spring. These offsets should be planted three or four in a hole, in beds or borders about three feet wide, and the holes should be about six inches asunder every way. The plants thus set need only be kept clear from weeds, and they will multiply exceedingly in almost any soil and situation.

*Sorrel* is used for many purposes in the kitchen, and they who are fond of acid herbs in their sallets cannot well have one whose tartness is more agreeable. The two sorts chiefly cultivated in the kitchen gardens here are, the common sorrel, which has longish and sharp pointed leaves, and the round-leaved garden, or Roman sorrel. Both of these are perennial; but the round leaved sort is most esteemed.

This is propagated by it's creeping roots, which may be transplanted either in spring or autumn; but the autumn is best for dry ground. The distance between them should be at least two feet every way; for this plant spreads pretty far, and increases greatly, especially on stony land; for it's natural growth is upon rocks. It seldom produces good seeds; and hardly any at all when it is set in a light soil.

The common sorrel, which grows naturally in pasture lands in most parts of England, and which is considerably improved by culture in the garden, is multiplied either by it's seeds, or by parting of it's roots. The former of these methods produces the largest and most succulent plants, if they are allowed sufficient room: but in whichever way they are raised, they should stand at least six inches asunder, in rows so far distant from each other as to admit of digging the ground between them every spring, if not oftener, especially in the  
hot



hot months, besides hoeing up the weeds whenever these are numerous, or begin to grow tall. Autumn is the best time for sowing of these seeds upon dry land, and also for parting or transplanting the roots, which, with the above management, may stand un-removed for two or three years.

The seeds of the annual sorts of sorrel should be sown about the latter end of March, on a bed of common earth, in rows a foot and an half asunder; and when the plants are come up, they should be thinned to the distance of four or five inches from each other. This, and keeping them clean from weeds, is all the culture that they will require: but both their size and their goodness will certainly be increased by a good stirring or two of the ground, which may easily be given at the time of weeding; for both should be done in dry weather. These plants will flower in July, and their seeds will ripen in autumn.

*Succory.* See *Endive*.

*Tarragon* is propagated by seeds, slips, or cuttings. March or April is the proper time for setting them, and they may be transplanted again in the summer. The plants should stand at least a foot asunder every way, and they should be kept clean from weeds. They will endure great cold; and even extraordinary drought will not hurt them, if they are but a little watered, or if the earth about them is kept loose and well stirred. A very few of their leaves mixed with a sallet, particularly of lettuces, give it a high aromatic flavour. The tenderest and freshest are the best for this purpose.

A former possessor of the copy of Mr. Worlidge's Husbandry now in my hands, has written upon a blank leaf at the beginning of it, the following directions for raising a sallet of small herbs very expeditiously, in a chamber, or elsewhere within doors. I mention it only as a matter of amusement.



“Take a pan as big as your hat, fill it with water, spread over it a cabbage net which shall just touch the surface of the water, and lay upon this wool which shall also just touch the water: when this wool is wet through, sow upon it seeds of mustard, cresses, radishes, lettuce, &c. and in a fortnight their plants will be fit to cut for a salad.”

The same may be done, rather more conveniently, by strewing these seeds between two pieces of flannel wet and spread in a dish, which may be set in a window. The young plants will soon pierce through the upper flannel, if only a little water be kept constantly in the bottom of the dish, to continue the moisture necessary for their vegetation.

## ARTICLE V.

### *Of sweet Herbs.*

**BALM** is either raised from seeds, or propagated by slips from its root, which is perennial, though its stalks are annual. The spring is the best time for sowing these seeds, and October is the most proper time for setting the offsets, that they may have time to get strength before the frosts come on. The roots of this plant may be parted into small pieces, with three or four buds to each, and these slips should be set two feet asunder in beds of common garden earth, where they will soon spread so as to meet each other. The only culture which they require is, to water them till they have taken root, to keep them clear from weeds, to cut off their decayed stalks in the autumn, and to stir the ground between the plants where it is not covered by their leaves.

The virtues of this herb are well known.

*Basil*



*Basil* is of several sorts: that which bears the largest leaves, especially if they are of a purplish colour, is reckoned the best; but that which has the smallest leaves is accounted the most curious; and that with middling sized leaves is the most common. All these are annuals, and very tender plants; for which reason it seldom is attempted to raise them otherwise than by sowing their seeds in a hot-bed. These seeds are very small, somewhat oval, and of a dark cinnamon colour. March is the most proper time for sowing them: the hot-bed should be gentle; and when the plants are come up, they should be transplanted into another yet more moderate hot-bed, where they must be shaded and watered till they have taken fresh root: or, if they are sufficiently thinned, the remainder of them may be left where the first grew. In either case, they should be gradually accustomed to the air, and have plenty of it in mild weather; they should be watered frequently, for they love moisture; and they should be taken up in May, with a ball of earth about their roots, and transplanted into pots or borders, where they must be shaded and watered again, till they have taken root. They will require no farther care, except weeding them, and refreshing them with water in dry weather till they have perfected their seeds, which will be in September. The seeds of those sorts which appear most distinct, may then be saved separately, for sowing in the next spring: but as they seldom ripen perfectly in the open air in this country, we generally use those which the seedsmen import from the south of France, or from Italy.

If any particular sort should arise from the seeds, and the possessor thereof should be desirous to increase it, cuttings may be taken off any time in May, and planted in a moderate hot-bed, where they



will take root in about ten days, if they are well shaded and watered, and in about three weeks they will be fit to remove into pots or borders.

As the odour of these plants is too strong for most people, especially if they are in the same room, or otherwise near them, they should always be set at some distance from the habitation; lest their perfume, if there be any quantity of them, should extend to the apartments, when the windows are open.

*Borage*, is an annual plant, which, if suffered to sow itself, will come up plentifully, and grow without any care. Its seeds are small, oval, and black, with generally a speck of white at their lower end. If these are sown on an open spot of ground, and if the plants are kept clear from weeds, by one or two hoeings, and thinned to the distance of six or eight inches from each other, they will require no farther trouble. The plants raised in the autumn will flower in May, but those raised in the spring will not blossom till June; so that, where a continuation of these flowers is desired, there should be a second sowing in the spring, about a month after the first: but this should be in a shady place, though not under the drip of trees; and if the season is dry, the ground must be watered frequently, to bring up the plants. These will continue flowering till the end of summer.

*Burnet* of a smaller kind than either of the sorts mentioned in the preceding volume of this work<sup>y</sup>, has frequently a place in the kitchen garden, either for the sake of its young leaves, which are mixed sparingly with sallots, or for those leaves when older, to put into cool tankards. As a physical herb, it is accounted cordial and alexipharmic, and

<sup>y</sup> See *Vol. III. p. 283—291.*



the powder of it's root is thought to be of service against spitting of blood.

This plant may be propagated by parting of it's roots and setting of these offsets in the autumn; but it is most easily raised from seeds sown in that season, much rather than in the spring, because these last often lie in the ground till the next year. If the young plants are transplanted to the distance of a foot asunder, in a bed of common earth, and watered till they have taken root, they will not require any farther care, but keeping them clear from weeds. They will last several years; for the roots of this species are perennial: or they will sow themselves, and thereby produce a plentiful crop of new plants. The soil for burnet should be dry.

*Calamint* is used chiefly for medicinal purposes: It is hotter than mint, and abounds more with subtil and volatile parts. If planted in the garden, it may be raised from slips, offsets of the roots, or seeds. It's culture is the same as that of balm.

*Carduus*, though not one of the sweet herbs, merits a place in some remote part of the kitchen garden, on account of it's medicinal use to a country family, which may not, perhaps, always be able to get it immediately from an apothecary's shop. I therefore beg leave to mention it here, as I just now perceive my having omitted it before.

The *Carduus Benedictus*, or blessed thistle, which is the species here meant, is most commonly propagated by sowing it's seeds in the autumn, on a bed of common earth, in a dry place. The plants, which will soon come up, should be transplanted in the spring, so as to stand a foot asunder every way. If the season is dry, they must be watered two or three times, till they have taken root, after which they will require no farther care, but to keep them clear from weeds.



The plants raised from these seeds sown in the spring, do not thrive so well, nor grow so large as those of the autumnal sowing.

This plant should be cut for use when it's flowers are full blown, which is in June, before it's lower leaves decay: when cut, it should be spread in a dry shady place for three or four days, then tied up in bunches, and afterwards hung up in a dry room, upon rows of strings, where the air may pass freely between them, to prevent their growing mouldy.

The seeds of those which are left uncut will ripen in autumn, and the plants will then die. These seeds are oblong, streaked, of a brown colour, and encompassed with stiff bristles at the top.

The whole of this plant is very bitter.

*Chamomile* grows wild upon commons and other waste land in many parts of England, particularly in moist and shady places, which it most delights in. It is a trailing perennial plant, which puts forth roots from the joints of it's branches as they lie on the ground, and thereby spreads and multiplies exceedingly; so that whoever would cultivate it, need only procure a few slips of it in the spring, and plant them about a foot asunder, that they may have room to spread: they will soon cover the ground.

Chamomile walks were formerly a sort of fashion in gardens; and indeed they looked pretty enough for some time after they were mowed and rolled: but they are now quite disused, because this plant is very apt to decay in large patches, which then become disagreeable to the eye.

The chamomile flowers which are used medicinally should be of the single kind, because they are strongest: but the market people generally sell the double because they are the largest.

The



The double flowered sort is as hardy as the single, and may be propagated in the same manner.

*Coastmary* is a name sometimes given to *Tansy*; which see.

*Dill* must be sown where it is to remain, for it will not bear transplanting. The soil for this plant should be light, and it's seeds should be sown in the autumn, soon after they are ripe; for they seldom grow well if they are kept out of the ground till spring. When the plants are come up, they should be thinned to the distance of eight or ten inches from each other, that they may have room to put out their lateral branches, and if they are afterwards kept clear from weeds, by good hoeing, they will not require any farther care. When their seeds begin to be formed, such of them as are intended to be put into pickle for cucumbers (for that is their chief culinary use) should be cut; and when the seeds of the remainder, destined for sowing, are ripe, they should be dried upon a cloth, and then beaten out. If they are suffered to sow themselves, they will produce in the spring a multitude of young plants, which will want no other culture, than thinning them with a hoe, and keeping them free from weeds.

*Fennel*, like dill, to which it is near a-kin, is best raised from seeds sown soon after they are ripe. These seeds are small, longish, oval, and of a yellowish colour, striped with greenish grey streaks. They will grow in any soil or situation; and the plants produced by them (which will come up in the spring) require no other care than thinning them where they are too close, and keeping them clear from weeds. They will flower in July, and perfect their seeds in autumn.

The roots of the common fennel are stronger, more fleshy, penetrate deeper into the ground, and  
last



last some years longer, than those of the sort distinguished by the appellation of sweet fennel: but, this excepted, there is little difference between them, unless it be, that the leaves of the sweet fennel are the longest, slenderest, and least numerous; that it's stalks do not rise so high as those of the common kind, and that it's seeds are longer, narrower, and of a lighter colour. Both of these sorts are very hardy, and require equally little trouble in their culture. They spring again when cut, and their youngest and tenderest shoots are the best for use.

*Finocchio* is a species of fennel too tender to ripen it's seeds perfectly in this country. We therefore import them from Italy, where it is cultivated as a sallet herb; for it is too strong for an English stomach, though some few curious gentlemen do now and then raise it here. It's stalks are very short; but fleshy, tender, and near two inches thick, to the height of four or five inches above the ground; and this is the part which is eaten, when blanched, with oil, vinegar and pepper. Even at their utmost growth, when run up to seed, the stalks of this plant seldom rise higher than about eighteen inches. It's seeds are narrower, more crooked, and of a brighter yellow, than either of our before-mentioned sorts of fennel. They have also a very strong smell like aniseed, and are very sweet to the taste.

These seeds, which must be perfect in their kind, or they will not be worth the trouble of cultivation, should be sown in shallow rills made in a well dug spot of light and rich earth, neither very dry, nor over moist; for this plant will not thrive in either extreme. The drills should be drawn by a line, and the distance from each other should be at least two feet, that there may be room to clean and stir the ground between them, and also to  
earth



earth up the plants when they are full grown. The seeds should be scattered thin in these rills; for the plants in them should stand pretty far apart, lest they should impoverish one another: but as an allowance must be made for the miscarriage of some, they may be sown about two inches asunder. Half an inch deep of earth will cover them sufficiently.

The first crop, which may be sown about the middle of March, will, if it succeeds, be fit for use in July; and by continuing to sow at the distance of about every three weeks, till the latter end of July, a succession of this plant may be had till the hard frosts set in. The crops sown in April, May, and June, should have a proportionably moister soil than that which was chosen for the first; and those which are sown late in July should have a drier soil and warmer situation, because, as the plants of this sowing will not be fit for use till the autumn is pretty far advanced, they would be liable to an increase of accidents, from too much wet, or cold, if they were sown in a moist soil. But it is to be observed, that as the ground is often extremely dry in June and July, and the seeds are, for that reason, most apt to miscarry then, it will be right to water and shade the beds in which they are sown at that time, and if the weather should continue to be very dry, the plants themselves must be watered pretty frequently, or they will run up to seed, without growing to any tolerable size. When this is practised, the directions of gardeners are, to make a channel at each row of the plants, to detain the water which is poured on them: but numbers of experiments in the new husbandry prove, that the earth is constantly preserved in a state of sufficient moisture, even in the driest seasons, by stirring it well, deep, and frequently; without any danger of rotting the plants, or chilling their roots,

as



as must be the case when water is suffered to remain long near or upon them.

When the plants are come up, which will be in three weeks or a month after sowing, all the weeds between them must be carefully hoed out, and they must be thinned to the distance of about four inches from each other. As they advance in growth, and new weeds spring up, the hoeing must be repeated from time to time, and they should at last be thinned so as to stand at least eight inches asunder in the row. If the plants are of a good kind, their stems will swell to a considerable bulk just above the surface of the ground; and this part should be earthed up, in the same manner as is practised for celeri, to blanch it, about a fortnight before it is to be used. This will render it crisp and tender.

The late sown plants, besides being likewise earthed up, to blanch them, whenever they are fit for it, should be covered with straw, peas haulm, or some other light covering, in the autumn, if any sharp frost should happen then; and by this means they may be continued fit for use till the middle of winter.

*Hyssop* is propagated either by seeds, slips, or cuttings, and thrives best in poor dry ground; for it will bear the cold of our climate better there, than when it is planted in a richer soil, in which last it will grow very luxuriant in summer, and consequently be the more tender when the warm weather is past. Such of these plants as chance to grow out of the joints of old walls, for example, as they frequently do, will resist the severest frost, and be much more aromatic, than those which are raised in the finest dunged land.

If *hyssop* is raised from its seeds, they should be sown in March, in a light sandy soil, and when the plants are come up, they should be transplanted



ed into the poor ground where they are to remain, at the distance of at least two feet asunder every way; for they grow pretty large if they are not frequently cut. The slips or cuttings of this plant should be set in April or May, and they must be defended from the heat of the sun, and be frequently watered, till they have taken root, which will be in about two months. They must then be transplanted into the places where they are to remain, and their management after this is the same as before directed for the seedlings. All these plants flower in July and August, and ripen their seeds in September; but their roots will last many years. The only sort of hyssop cultivated for use in this country (for the other sorts raised here are merely for curiosity) does not rise higher than a foot and an half; it's flowers are blue, in spikes; and it's seeds are small, oblong, and black.

*Lavender*, whether of the broad leaved species, generally called Spike, or Lavender Spike, or of the common narrow leaved sort, is chiefly propagated by cuttings or slips of a year's growth. These should be planted in March, in a shady situation, or at least they should be shaded with mats till they have taken root. They may then be exposed to the sun; and after they have got sufficient strength, they should be removed to the places where they are to remain. The broad leaved lavender does not often produce flowers; but when it does, they appear towards the latter end of July, at which time the spikes of the common sort, which blossom the earliest of the two, and which is the kind cultivated for medicinal uses, are fit to be gathered. Both these sorts will grow quickest, in the summer, if they are planted in a rich and moist soil; but then they seldom escape the inclemency of the winter: nor will they have half so strong an aromatic scent, or last near so



so long, as those which are situated on a dry, gravelly, or stony soil. In such land as this, or even upon a barren rocky spot, where their spicy odour will become still more exhaled, they will resist all the severity of our hardest winters.

*Lavender-cotton* is propagated in the same manner as the former sorts of lavender; but it is a much more tender, and far less fragrant plant. It's leaves and sometimes it's flowers, are used in medicine, and are reputed good to destroy worms.

*Marigolds* are raised from seeds sown in March or April, in the place where the plants are to remain. They require no other culture than keeping them clean from weeds, and thinning them to the distance of about ten inches asunder, that their branches may have room to spread. They will begin to blossom in June, and continue in flower till the frost kills them. Their seeds will ripen in August and September, and, if they are suffered to sow themselves, will produce a plentiful crop of young plants in the next spring: but as these will consist of a mixture of good and bad sorts, it is most advisable to prevent this spontaneous growth, to save the seeds of the best flowers only, and to sow each variety, whether single or double, by itself.

*Marjoram*. The common sort of this plant, generally distinguished by the name of *sweet marjoram*, is esteemed an annual, though it's roots live through the winter in mild seasons. Mr. Miller therefore thinks it only biennial<sup>2</sup>. It is propagated by seeds, which, as they seldom ripen in this country, are usually imported from the south of France, or from Italy. They should be sown about the latter end of March, in a border warmly situated, and when the plants are about an inch

<sup>2</sup> *Gardener's Dict.* Art. ORIGANUM.



high, they should be taken up carefully, with as much earth as can be about their roots, and set six inches asunder every way in a bed of fine rich mould. They must be watered there till they have taken fresh root, and after that they will require no farther trouble, except keeping them clear from weeds. They will soon spread so as to cover the ground, and their heads will begin to flower in July, which is the time to cut them for use. They are then called knotted marjoram.

The sort now commonly known by the name of *winter sweet marjoram*, was formerly termed pot marjoram. This is propagated by parting of it's roots in autumn, when they should be set in a pretty dry soil, at sufficient distances to give them room to spread. These offsets must be watered till they have struck out new roots, and the trouble of their culture is then over, except weeding them whenever it may be necessary. This plant is cultivated chiefly for nosegays, because it blossoms sooner than the common sweet marjoram: but it is also used for the same culinary purposes, until the other becomes fit to gather.

The species now distinguished by the name of *pot marjoram*, because it is the sort generally used in the kitchen, is, in fact, the common wild origany, or marjoram, improved by culture in the garden. This is the most hardy kind of marjoram, and may be very easily propagated, either by sowing it's seeds in the spring or in autumn, but the autumn is best; or by parting it's roots, and then setting them anew, especially in the last mentioned season. Any soil that is not over moist will do for this plant, and it will also thrive in any situation, if it be but kept clear from weeds. It flowers in June and July, and it's seeds ripen in the autumn. If these are permitted to scatter, they will sow themselves,



themselves, and a vast number of plants will arise from them in the ensuing spring.

*Mint* of all kinds (for there are several species of it) is very easily propagated by parting of it's roots in the spring, or by setting cuttings of it during any of the summer months, in a moist soil. If the season should prove dry, these cuttings must be watered often till they have taken root, and after that they will not require any farther trouble, except good weeding. If any quantity of these plants is raised (for example, for distilling), they should be set in beds about four feet wide, with a path a foot and an half or two feet broad, to go between the beds, in order to water, weed, and cut the mint; and the distance between the plants should be at least five inches every way, that their roots may have room to spread: for this they do to so great a degree, that they will mat together, and rot each other, if they are suffered to stand above three years in the same bed.

When mint is cut for distilling, or for any medicinal use, this should be done in very dry weather, when the plants are just coming into full bloom, for they are fullest of sap, and highest in flavour, at that point of time. What is then cut should be hung up to dry in a shady place, till it is wanted for use: but care must be taken not to hang it against a wall, because this will make it turn black and mouldy. The same will also happen to mint that is cut in wet weather.

If the soil be fit for this plant, it will afford three general cuttings every year: but those shoots which come out after July are seldom good for much. These should therefore be let stand till Michaelmas, when it will be right to cut the whole down close to the ground, and, after carefully clearing away all the weeds, to sift a little fine rich earth all over the beds, to the thickness  
of



of about an inch. This will give great vigour to the roots left in the ground, and will make them shoot out finely the next spring.

Some people, who are very fond of mint sauce or *fallet* in the winter or spring, take up the roots of this plant a little before Christmas, or even somewhat earlier, and plant them pretty close in a moderate hot bed, where they cover them about an inch thick with fine earth, and then lay mats, or a frame of glass, over the bed. The mint thus planted will come up, and be fit to cut in a month's time.

Spear mint and pepper mint are the sorts generally used for distilling. The water drawn from these is salutary, and will warm the stomach as well as any dram. Perhaps too it might be rendered equally palatable, even to the lower class of people, (who intoxicate and kill themselves with vile spirits distilled from grain), by a proper mixture of other agreeable aromatic herbs. If this could be done, and those unhappy creatures could be brought to relish it; how many lives, and what great quantities of wheat, might it not be a means of saving!

*Pennyroyal* propagates itself very fast by it's numerous trailing branches, which fasten to the ground at every joint, and from thence put forth roots and new shoots. Nothing is therefore requisite in order to it's culture, but to cut off some of these rooted branches, and to transplant them into other beds. This should be done in September, that the young plants may have time to fix, and gather strength before the winter comes on: for in this case they will yield a much larger crop the next summer, than they would do if they were removed in the spring. They should be set at least a foot asunder every way, that they may have sufficient room to grow in: for the roots of this plant, like those of mint,



multiply so exceedingly, that, if they are planted at a smaller distance, they will mat together in the space of a year, and afterwards soon rot one another in the winter. If the soil in which these plants are set is moist, strong, and somewhat shady, (for that is their favourite situation) they will flourish amazingly,

*Rosemary* may be raised from seeds; but it is more commonly, and more easily propagated by planting slips or cuttings of it in a spot of fresh light earth, in the spring of the year, just before it's buds begin to open. When these plants have taken root, till which they must be watered gently from time to time, and shaded if the sun be too powerful, they should be transplanted into the places where they are to remain. This should be done early in September, that they may have time to strike out new roots before they can be in danger of being hurt by frosts; for those which are set too late in the autumn seldom live through the winter, especially if the weather prove very cold. Rather than do this, it is better to let them stand till the next ensuing March, and then to remove them after the hard weather is over: but in whatever season they are transplanted, it should not be during a cold drying easterly wind; because this would soon shrivel up their leaves, and kill them. If a few warm showers fall soon after they are set, they will soon take root, and after that they will require no farther care, than keeping them free from weeds. The distances between the plants should be full sufficient to allow for their utmost growth, so that they may not touch one another. That growth will be most luxuriant, especially in the summer, if they are set in a rich mould: but then they will be most subject to be injured by frosts; nor will their odour be near so strongly aromatic, as when they are raised on a  
poor



poor, dry, gravelly soil. In this last, all the species of rosemary, except perhaps the striped sorts, and that in particular with silver striped leaves, which is the most tender, will resist all the cold of our ordinary winters extremely well. Many of them grow naturally upon dry barren rocks near the sea, in the south of France, in Italy, and in Spain; and thrive there so very much as to perfume the air to a considerable distance from the shore: and it is remarkable here, that, tender as these plants are when set in a garden, they will endure our bleakest winds, and severest winters, if, as it sometimes happens, they chance to be rooted in a wall. The reason is, that they are then most concentrated, and consequently strongest, in their growth, and that their roots are in a dry situation.

*Rue* may be propagated either by sowing it's seeds, which are small, rough, and blackish, or by planting slips or cuttings of it, in the spring. The manner of cultivating these last is the same as for lavender and other hardy aromatic plants. It's seeds should be sown, and but lightly covered, in well dug fresh earth; and when the plants are about two inches high, they should be transplanted into a dry soil, where they are to remain. A moist soil would be apt to make them rot in the winter.

*Sage* is most commonly propagated by slips; not only because it's seeds cannot always be obtained perfect in this country; but also, because that is by much the easiest and most expeditious way. These slips should be planted about the beginning of April, in a shady border, where they will soon take root, if they are watered now and then in case the season be dry. When they are grown strong enough to be removed, they should be taken up with a ball of earth about their roots, and transplanted into the places where they are to remain. This should be in a dry soil, where they



may enjoy the benefit of the sun : for if they are left to remain in moist ground, or in a shady situation, they will not well bear the inclemency of the winter : neither will they be so hardy, or so highly flavoured, if they are set in a rich soil, as when they grow on a barren, dry, and rocky spot. Keeping them clear from weeds is the principal part of their culture. The roots of all the common garden sorts of sage will last several years : but their tops should not be cropped too often for use, lest the plants should become ragged, and there should not be a due succession of young shoots. The surest way to obtain this, is to set a parcel of new slips every other year. The side shoots, and tops of the balsamic or tea sage, which is generally dried and kept for use, should be gathered in a very dry day, in the summer ; but those of the other sorts are best when taken green from the plants.

The species of sage most usually cultivated in the kitchen garden, are, the large broad leaved sort, of which the common green, the wormwood, the variegated green, the red, and the variegated red, are only accidental variations; the tea sage abovementioned, which also has broad leaves, but more jagged at their edges ; and the small, or rather narrow, hoary leaved sage, commonly called sage of virtue. All the other sorts of this plant are cultivated for variety, more than for use.

Sage, in general, flowers about the end of June and in July ; and whenever it's seeds do ripen in this country, it is in the autumn.

*Savory* (the) cultivated in the kitchen garden is of two principal sorts, viz. summer savory, and winter savory, the uses of both of which are nearly the same.

The former of these is an annual plant, raised only from it's seed, which should be sown in the beginning of April, in a bed of loose and light earth.

If



If the plants are not intended to be removed, their seeds should be scattered thinly; but if they are to be transplanted, they may be sown thicker. They must be kept clear from weeds, and are, in other respects, to be treated as before directed for marjoram.

Winter savory may be propagated from seeds sown at the same time as those of the summer sort; or by slips off it's roots, for these are perennial, and will last several years: but as they do not put forth equally tender or well furnished shoots after they are grown old, the best way is to raise a supply of young plants every other year. The slips of the winter savory will soon take root and flourish; and they, as well as the plants of this species raised from seed, will endure the greatest cold of our winters, and have the most aromatic smell and taste, when they are planted in a poor and dry soil. Wet ground is very apt to render them mouldy, and consequently to make them rot. Mr. Miller<sup>a</sup> has noticed some of these plants growing upon the top of an old wall, where they were fully exposed to the cold, and they there survived such severe frost as killed most of those of the same kind that were planted in the ground.

The winter savory flowers in June, and the summer savory in July; but the seeds of both ripen in the autumn, at no great distance of time from each other.

*Southernwood*, of which there are very many species, and some of them pretty enough, is not cultivated for any use that I know of, beyond decorating the bough-pots and little courts of the citizens of London. For that, indeed, it is well adapted, because it endures the smoke of this town better than most other plants. It was formerly

<sup>a</sup> *Gardener's Dict.* Art. SATUREJA.

used in medicine, but is not so now. Nothing is easier than to propagate it by slips or cuttings, which need only be planted in good light earth, about the end of March or beginning of April, and watered two or three times a week, if the season be dry, till they have taken root. This will also be accelerated by shading them in the middle of the day.

*Tansey* is used in medicine, and in the kitchen: It is very easily propagated by it's creeping roots, which multiply so exceedingly as soon to spread beyond their intended limits, if there be not a path around the bed destined for them, and if this path be not dug up pretty frequently, so as to cut off the rambling shoots. The slips of this plant should be set at least a foot asunder, and in beds by themselves. They may be transplanted either in the spring or in the autumn, for they will soon take root; and they will thrive in almost any soil or situation.

The varieties of the common tansey generally cultivated in the kitchen garden are, the double tansey, as the gardeners term it, another with variegated leaves, and a third with larger leaves which have but little scent. The other sorts of tansey, of which there are several, are mostly too tender for the open ground in this country.

*Thyme*, of which the botanists enumerate nine different species, besides several varieties, is propagated either by seeds, or by parting it's roots. The most useful sort, either for culinary purposes, or for medicine, is the broad leaved thyme, most commonly cultivated in the kitchen garden; for the narrow leaved kind never grow so large. Their culture is, however, exactly the same.

The seeds of thyme, if it be raised from thence, should be sown either in March or October, but the former of these months is best, in a well dug  
bed



bed of light earth ; taking care, as they are very small, not to drop them too close together, nor to bury them deep, for this last would make them rot. When the plants are come up, they should be carefully over looked and cleared from weeds, and if the season be dry, their growth will be greatly promoted by watering them twice a week, for some time. In June, if it be a spring sowing, the plants should be thinned to the distance of six inches asunder every way, that they may have room to spread : and those which are drawn out may be set in other beds, at the same distance from each other. They must be watered till they have taken root, and will then require no farther care, except weeding them, till the winter, when they may be pulled up, and laid by in a dry place, for use. The autumnal sowing should be thinned as before, early the next spring, if it be let stand till then ; for there will be little danger of it's resisting the severest winter of this country, especially if the plants grow on a dry, poor, and stony land. In rich ground, indeed, where they grow luxuriantly, they are sometimes destroyed by severe frosts. Thyme will even flourish upon a stone wall.

If the plants are propagated by parting their roots this should also be done in March or October. The old plants should be taken up, their roots should be split into as many parts as can be, and these slips should be set six or eight inches asunder every way, in beds of fresh light earth. If the season is dry, they must be watered there till they have taken root ; and with only weeding of them afterwards, they will soon be fit for use.

To save the seeds of thyme, some of the plants should be left unremoved till the next spring. They will then flower in June, and their seeds will ripen in July. These must be pulled up and beaten out as soon as they are ripe ; for the first shower

of rain would otherwise wash them all out of their husks.

Thyme is so great an impoverisher of the earth, that no crop will thrive well where that stood the year before, unless the ground be trenched deeper than the thyme rooted, and at the same time enriched with dung, or some other suitable manure,

## A R T I C L E VI.

*Of Plants which are commonly raised in a Hot-Bed.*

**B**EFORE I proceed to the particular instructions of experienced gardeners for the culture of these plants, it will be right to give some general directions for making the hot beds on which they are to be raised. This, for all the common and necessary purposes of the kitchen garden, is formed with dung: for stoves, and beds of tanner's bark, being used for the rearing and preserving of curious exotics, belong to a more refined branch of horticulture, than is intended to be treated of in this work.

A quantity of new horse dung, taken from the stable, together with some, but not too much, of the straw which has been used there for litter, should be thrown up in a heap, to ferment in a remote corner; and a few sea coal ashes should be mixed with it, to render the warmth of the dung the more lasting. At the end of six or seven days, this heap should be turned over, all its parts should be thoroughly mixed together, and the whole should then be laid up again for five or six days more, by the end of which it will have acquired a sufficient degree of heat. The quantity of dung thus fermented should be proportioned to the size of the intended bed, or beds.



beds. One good load at least will be requisite for each light of a hot bed that is made early in the year: but somewhat less may do for such as are made in a milder season.

A suitable and well sheltered spot being chosen, in as warm and sunny a situation as can be, either in a corner of the garden, or, which is most eligible, just without it's wall, as before advised<sup>b</sup>, the better to avoid filth and litter; a trench, of length and breadth suited to the frames intended to be used, should be dug in it, about a foot, or a foot and an half deep, if the ground be dry, but not above six inches deep in a moist soil. The dung, prepared as before, should be wheeled into this trench, and there spread as even as possible over every part of it, with particular care to stir it thoroughly, and beat it down very close, with a fork, as it is laid on; for this will help to prevent worms from making their way through it. If the dung is pretty full of long litter, it should not only be beaten, but also trodden down close and equally, the better to guard against one of the greatest dangers these beds are liable to, which is, their heating at first too violently, and afterwards cooling too soon. The bottom part of the heap of dung, which is generally free from litter, should also be laid on the top of the bed, the more effectually to confine the steam to the dung; and, still farther to keep down the heat, and hinder it from rising so strongly as to burn the roots of the plants set in the mould over it, as sometimes happens if this precaution is not taken, a good way is to spread a layer of neats dung all over the surface of the bed of horse dung: but if, with all this, the bed does not cool so fast as is desired, it may soon be reduced to a moderate temperature,

<sup>b</sup> See p. 20.



by leaving it a little while totally uncovered, and thrusting a large stick into the dung, on each side of the bed, in two or three places, to make holes, out of which the great steam will quickly pass off.

If the hot bed is designed for early cucumbers, or for melons, it should not be covered all over with earth at first, but only a hillock of mould should be laid in the middle of each light, the plants should be set therein, and the remaining space should be earthed up from time to time, as their roots extend, in the manner which will be more fully explained under each of these articles. If it is intended for other plants, two or three days should be allowed for the first steam to pass off, before the earth is laid upon the dung.

The depth of the dung should, in general, be at least three feet, and that of the mould upon it about six inches.

During the first week or ten days after the bed is made, the glasses over it should not be shut down closely at night, and care should be taken to raise them up in the day time, that the steam which always arises copiously from dung while it is fresh, may have room to fly off: but as the heat abates, the covering should be closer, for fear of stinting the growth of the plants, or, perhaps of killing them.

To restore warmth to one of these beds after it has cooled too much, a pretty good quantity of new hot dung should be laid up to it's sides. This will revive it's heat for a considerable time; and, as the spring advances, the sun will supply the after loss of the warmth of the dung. To aid this, it will be advisable then to lay some mowings of grass around the sides of the bed, especially if the nights should be cold, as they often are in May, even to such a degree as to prove very hurtful



ful to tender plants in hot beds, if great care is not taken of them.

Those who have not the convenience of frames and glass lights, may, though it is not near so good a method for plants which require very careful and tender treatment, arch their hot beds over with hoops, and cover these with bass mats, which may be taken quite off in the middle of a warm day, and put on again at night, securing their bottoms well all around, by laying upon them bricks which will keep them down very close.

When the first extreme heat of the bed is over, which may be known by thrusting in one's finger, or by pulling out and feeling the end of a stick that has been stuck pretty deep into it for some time, it is fit for sowing the seeds, or setting the plants, which are intended for it,

The whole of the space actually used for hot beds, or for a melon ground, as it is commonly called, should, besides it's other more distant shelter, be defended from every adventitious wind, by fencing it closely round with a reed hedge made in pannels, so that any part of it may be taken up, and easily removed, as occasion may require<sup>c</sup>. This hedge should be six or seven feet high, and it's distance from the bed should be at least such as to afford convenient room for a man to go between them with a weel-barrow, after the sides of the bed have been extended by the addition of fresh dung, or mowings of grass, if either of these should be necessary. It should also be so far from the bed, as not to obstruct the rays of the sun during any part of the day.

The east wind and the north are most to be feared for hot beds, in the spring, and consequently most necessary to be guarded against in that

<sup>c</sup> See p. 21.

season, because they then generally blow so cold and strong, that it would be difficult to admit with safety a proper share of air to the young plants exposed to either of those aspects; and in the summer and autumn, danger may be apprehended from the south west winds, because they are apt to be very boisterous in this country. A hot bed is therefore in the most eligible position, when it lies open to the south, or inclines a little to the east, and is sheltered from the other points by distant trees, besides the reed hedge of which I have been speaking.

The plants commonly raised in a hot bed, for the use of the table, are the following.

*ASPARAGUS*, which I did not, at first<sup>d</sup>, intend to treat of in this light, because it is not worth the husbandman's while to be at the charge and trouble of forcing these plants, as the gardeners term it, that is to say, of raising them out of their natural season, by the help of hot beds: but as some country gentlemen, who can better afford it, may like to have a few dishes of them at a time when the common beds in their kitchen garden will not furnish any; I shall here give a few short directions for obtaining them in any part of the winter.

About five or six weeks before the time at which it is desired to have asparagus fit to cut, a sufficient number of good roots, transplanted from the seed bed two or three years before, should be set in a hot bed prepared as above directed. The best ground to take them from, for this purpose, is a low, moist, rich soil; because they will have grown largest there. One rod of such land planted in six rowed beds, the rows at ten inches distance from each other, and the plants about eight

<sup>d</sup> See p. 61.



or nine inches asunder in the rows (for these are the spaces commonly allowed when they are intended for the hot bed), will generally furnish roots enough for one light. Most of the kitchen gardeners about London use, for their forced asparagus, roots which have been transplanted but two years from their seed bed: but unless they have been set in very good ground, they will be but weak, and consequently produce only poor thin shoots, in comparison of those which good roots of three years old will yield.

When the hot bed, covered with about six inches thick of earth, is of a proper temperature to receive them, that is to say, when the first violence of it's heat is so far abated that there is no danger of it's burning them, a row of these roots should be laid against a narrow ridge of earth raised about four inches high at one end of the bed, and row after row should then be continued, as close as possible to each other, but in strait lines, till the whole is covered. The crowns of the roots should be ranged exactly level, their buds should stand upright, and a small quantity of fine mould should be laid between each row. An edging of stiff earth must then be laid up to the roots, along the outsides of the bed, which are bare, to keep them from drying; and two or three sharp pointed sticks, about two feet long, should be thrust down between the roots, in the middle of the bed, at some distance from each other, for the use before mentioned of knowing the temperature of the bed, by pulling them out and feeling their lowest end, and of judging accordingly whether it's heat requires to be increased, or diminished; for both which directions have already been given.

In a few days, less than a fortnight, after the bed has been planted, the crowns of the roots must be covered with fine earth, to depth of about two inches;



inches; and when the buds have pierced through this, the thickness of about three inches more of earth should be sifted over them, so that, in all, the covering may be five inches above the crowns of the roots; for that will be sufficient for the growth of the shoots. After this, a band of straw, or long litter, about four inches thick, should be fastened round the sides of the bed, by running through it into the bed, strong, strait, and sharp pointed sticks, about two feet in length. The upper part of this band should be level with the surface of the bed; and upon it should be placed, after it is thus fixed, the hot bed frames with their glasses. These must be kept close covered with mats and straw in bad weather, as well as every night: but the covering should be taken off in the day time, especially when the sun appears, that it's shining upon the plants, through the glasses, may give a good colour to the asparagus.

If a bed of this sort works kindly, it will begin to produce shoots fit for cutting in about five weeks, and will continue so to do for about three weeks, in the course of which each light properly planted with good roots will yield about three hundred heads of asparagus. If, therefore, it be desired to have a succession of these plants until the natural ones come in, a new hot bed must be made every three weeks, from the season of the first, which may be about Christmas, to about the first week in March. This last will continue good till the natural season of asparagus comes round: and it is to be observed, that the latest made beds will always produce the largest and best coloured heads, and that these will be fit to cut a fortnight sooner than those of the first; because they will enjoy a greater share of sun, and, if the season be favourable, sometimes of air, which last will also render them better tasted.

*Capsicum.*



*Capsicum* (the), commonly called Guinea pepper, or Bell pepper, on account of the shape of it's pods, and yet more properly named Indian pepper, because it is a native of both the Indias, is propagated here by seeds sown on a hot bed in the spring. When the plants which arise from them have about half a dozen leaves, they should be transplanted into another hot bed, at the distance of four or five inches from each other, and there be shaded in the day time until they have taken root, after which a pretty large share of air should be admitted to them in warm weather, to prevent their being drawn up weak; and they should also be frequently watered. Towards the end of May, they should be hardened by degrees to bear the open air, and in June they should be taken up with as much earth as possible about their roots, and planted in a spot of rich ground, in a warm situation, about a foot and an half asunder. Here also they should be shaded and watered till they have taken root, and the watering should be continued afterwards in dry weather, as a means of greatly promoting their growth, of rendering them more fruitful, and of increasing the size of their pods. With this management, they will yield at least two crops of fruit in the same summer (for they are annuals); if the season be not too cold.

This sort, which Tournefort intitles<sup>e</sup> *Capsicum fructu longo, ventre tumido, per summer tetragono*, *Capsicum* with a long fruit, having a swelling belly, and square at the top, is the only kind proper for pickling; nor is it cultivated for any other use. It's pods are tenderer and more fleshy than those of any other species of this plant. They grow from an inch and an half, to two inches, in

<sup>e</sup> *Inst.* 153.

length,



length, and are very thick at their top, from whence they diminish gradually down to their point, generally with a pretty many wrinkles.

The manner of pickling these pods is thus. They must be gathered before they arrive to their full size, while their rind is yet tender; and after their seeds have been taken out, which is done by flitting them down on one side, they are soaked for two or three days in salt and water: they are then taken out of this, and drained, and boiling vinegar is poured on them, in sufficient quantity to cover them: after this they are stopped down close for two months, and at the end of that time they are boiled in the vinegar, to make them green. No spice whatever is put to them; and many reckon them the wholsomest and best pickle in the world.

To save the seeds of the capsicum for future sowing, one of the strongest, forwardest, and largest podded plants should be left untouched, particularly with regard to the not gathering of it's first formed fruits, which it is essential to leave, that they may have the more time to perfect their seeds before the frost comes on in autumn; for early frost generally kills these plants. When the fruit is ripe, at which time it is of a fine red colour, it should be cut off, and hung up in a dry room till it's seeds are wanted in the next spring.

It is from the fruit of a species of this plant, which the Americans, among whom it grows naturally, distinguish by the name of Bird pepper, and which the botanists entitle *Capsicum caule fruticoso, fructu parvo ovato erecto*, Capsicum with a shrubby stalk, and a small oval fruit growing erect, that the Cayan butter, as it is frequently termed, though more properly called Cayan pepper, is made. The inhabitants of America, who look upon these pods

as



as the best of all spices, call them pepper pots, and prepare them as follows.

They take the ripe pods of this sort of capsicum<sup>f</sup>, and dry them well in the sun, then put them into an earthen or stone pot, with flour between every layer of pods, and set them in an oven; after the bread has been drawn out, that they may be thoroughly dried. After this, they cleanse them well from the flour, pluck off the remaining stalks, if any have been left, and beat or grind the pods to fine powder. To every ounce of this they then add a pound of wheat flour, and as much leaven as is necessary to make it ferment; and after it has been well mixed and wrought, they make it into small cakes, which they bake in the same manner as is used for common cakes of equal size. They then cut these cakes into little bits, and bake them again, till they are as dry and hard as biscuit; and finally, they pound these bits very fine, sift them, and keep their powder for use.

I have transcribed this receipt, first, because the same method may possibly be practised here, by raising this plant in a hot bed, and afterwards treating it like the other sorts of capsicum, or perhaps it may likewise be done with the species which we commonly use for pickling; and secondly, which is the strongest reason, because this preparation is said, not only to give a better relish to meat or sauce, than the ordinary round grained East Indian pepper (which costs this nation a large sum every year); but also to be more cordially comforting to a cold stomach, and more effectual to dispel wind, phlegm, or viscous humours, and to help digestion.

<sup>f</sup> MILLER's *Gardener's Dict.* ART. CAPSICUM.



*Cucumbers*, for very early shew, that is to say, to decorate the table at a time when no prudent man would choose to eat them, are nursed in stoves by some fantastical gentry, who pique themselves on having this fruit fit to eat in every month of the year. But I shall here content myself with relating the more rational, and far less, troublesome, practice of those who have patience to wait till they can be produced in the natural seasons.

To have as early cucumbers as the not too much forced course of vegetation can yield in this country, their seeds should be sown, about the middle of March, or a little later if the spring be backward, either under a bell glass placed upon a spot of hot bed, or at the upper end of a more regular hot bed covered with frames, where they will not then take up the room of other plants. The rules before laid down for the due temperature of the hot bed should be attended to here; and when these plants are come up, they should be transplanted into another moderate hot bed, at the distance of about two inches asunder. Here they should be covered with bell or hand glasses set quite close to each other, and they should be shaded, and sparingly watered, until they have taken root. They should also be aired, as much as the weather will permit, by raising up the side of the glass opposite to the wind, in order to strengthen them, and when they have begun to put out their rough leaves, they must be re-transplanted on the ridges where they are to remain.

These ridges are made with new horse dung, in the same manner as before directed for the hot bed, excepting that they are neither so thick nor so wide. About two feet four inches will be sufficient for the breadth of the trenches in which they are made; but their length may be whatever is most convenient, according to the number



of plants intended for them. The trenches for these ridges should be about ten inches deep in dry ground; but very little earth need be dug away for them if the soil is wet. About one cart load of dung will make a ridge long enough, for five or six holes of cucumbers, at the distance of about three feet and an half from each other. This ridge of dung, being well beaten down and levell'd at top, should be covered with about four inches deep of earth, of which the same thickness should also be laid over it's sides. Hillocks of mould should then be raised up in the middle of the ridge, at every distance at which the plants are to be set; and after these have been closely covered with the glass'es during four and twenty hours, in order to warm the earth, and thereby fit it for the reception of the plants, they should be stirred up by hand, so as to make a little hollow in the middle of each, in the form of a bason: Four plants should then be set, as far as can be from each other, in each of these hollows, where they must again be watered and shaded until they have taken root; and after this they must be aired, by raising the glass'es on the side opposite to the wind, in proportion to the warmth of the weather: but they should be raised thus only in the middle of the day, until the plants begin to fill them; for after that, they should be propped up with a forked stick on the south side, to a height proportioned to the increase of the plants, which must be carefully preserved from being scorched by the sun. This will also harden and prepare them for the open air, to which they should not, however, be exposed too soon, because we frequently have morning frosts in May, which they would not be able to resist. Rather than run any hazard of this kind, the glass'es should be kept over them as long as can be without damaging



ing the plants; and this may be for a considerable time, if the glasses are raised all round, by setting them on three bricks.

About the end of May, when the weather begins to be settled and warm, and rather in a cloudy day which seems to promise rain, than in a very dry and sunny one, the plants should be gently turned down from out of the glasses; and these should then be supported over them at the height of four or five inches from the ground, by three forked sticks, which will hold them up very securely, and prevent their bruising the shoots of the plants underneath: for it is best not to remove the glass entirely before the latter end of June or the beginning of July, because they will preserve a moisture about their roots much longer than if they were quite exposed to the open air. The plants thus turned down will have made a considerable progress by the end of three weeks, especially if the weather has been favourable; and then it is that the spaces of ground between the ridges, or along the sides of the ridge if there be but one, should be dug up, and added to the bed, or beds, that the roots of the plants may be enabled to strike into it; for they will extend themselves a great way (some say as far as the vines), if they are not cramped. The runners of the vines should be laid in exact order, without tumbling them too much, or bruising or breaking of their leaves. Some pin them down gently with little wooden hooks, to prevent their being blown about by the wind. After this, they will require no farther care, except keeping them clear from weeds, and watering them when necessary, that is to say, when their greater leaves droop and hang down to the ground. But here it is to be observed, that, though pretty frequent watering of them increases their fruitfulness, they are best tasted,  
and



and wholsomeſt, when they have had but little water; and, though they ſhould be watered ſometimes in dry weather, they ſhould be carefully defended from rain when it is cold. The ridges thus managed will yield large quantities of fruit, from June till the latter end of Auguſt. Mr. Mortimer recommends<sup>s</sup> nipping of the top ſhoots of cucumber plants after they have put out three or four joints, as a means of making them knit the ſooner for fruit.

It is from cucumbers planted on ridges, like the above, that moſt of the gardeners about London ſave their ſeeds. To this end, they leave a number of the earlieſt and fineſt fruit upon the vines, until their ſeeds are perfectly ripe; and then, when the outer cover begins to decay, they cut them open, and ſcrape out their ſeeds, with the pulp, into a tub, which they cover over with a board, to keep out all filth. They let theſe ſeeds and pulp remain thus for eight or ten days, only ſtirring them well with a ſtick, to the bottom, every day, in order to rot the pulp, and make it ſeparate the more eaſily from the ſeeds. They then pour water into the tub, and ſtir the whole well about, till there ariſes a ſcum, after which they let the ſeeds ſettle to the bottom, and pour off the water. This they repeat two or three times, till the ſeeds are perfectly cleared from the pulp. They then ſpread them upon a mat expoſed to the ſun and open air for three or four days, till they are quite dry, and after this they put them into bags and hang them in a dry place, where vermin cannot come to them. They will keep good for ſeveral years, but are thought to produce the leaſt luxuriant, and therefore moſt fruitful, plants, when they are three or four years old.

<sup>s</sup> *Art of Huſbandry, Vol. II. p. 154.*



To avoid the trouble of making beds, or ridges, of dung on purpose for them, as above described, (which is undoubtedly the surest way to have early fruit), many people, who are less solicitous about the earliness, or even the great plentifulness of these crops, than the trading gardeners around London are obliged to be, only dig holes of the size of a bushel, fill them with warm stable dung, then set in the middle of them four or five cucumber plants, with as much mould as possible about their roots, and afterwards earth them up in the form of a basin, to render the watering of them the more effectual. They shade them till they have taken root, and cover them for a while with bell or with hand glasses, if they have any; or they even trust them at once to the open air. If the plants thrive, three of them will be sufficient in a hole; and then the rest of them may be plucked up, or transplanted elsewhere. Some even raise them from their seeds planted in holes of this kind, without any previous hot bed, and they do very well, if the season be at all favourable.

The time for sowing the latter crop of cucumbers, commonly called picklers, is the beginning of June. The London gardeners generally set these between their widest rows of colliflowers, which are four feet and an half asunder. To this end, they dig square holes about three feet and an half from each other, breaking the earth well, and hollowing the surface of each hole, with their hands, till it is like a basin. They then plant eight or nine seeds in the middle of each of these spots, and cover them with earth to the thickness of about half an inch. If the weather is very dry, they water them gently at the end of a day or two. In five or six days the plants will appear above ground; and particular care must be taken then to defend them from birds, especially



cially sparrows, which will otherwise soon pinch them off, and thereby frustrate all expectations of a crop: but this danger will be over in little more than a week; for the sparrows will not meddle with them after they have expanded their seed leaves. Care must also be taken to continue to water them gently, from time to time, according as the season is more or less dry, and when they begin to shew their third leaf, which is the first of their rough ones, all the weakest plants should be pulled up, leaving in each hole only four of the most promising and best situated. The ground about these should then be well stirred with a small hoe, to destroy the weeds, and earth up the plants, around the stems of which the mould should afterwards be gently pressed down by hand, the better to separate them from each other as much as can be without hurting them. This being done, they are watered a little to settle the earth about them, and at such other times as the dryness of the weather may render necessary: but, above all, they must be kept clear from weeds. When the colliflowers are quite removed, the whole ground should be thoroughly hoed and cleaned, fresh earth should be laid up around the plants, so as to deepen the hollows in which they stand, that they may the better contain water when it is given them, and their vines should be spread out carefully in the order they are to run, in such manner that they may not cross or be entangled with one another. A little earth should then be laid, and gently pressed down, between the plants, the better to separate them every way, and a gentle watering now, and as often afterwards as the season shall require, will forward their growth. With this management, these plants will begin to yield young cucumbers, fit for pickling, about the latter end of July, or early in August.



About fifty or sixty of these holes will be necessary for a middling family; because a smaller number of them will not afford fruit enough at one gathering to requite the trouble and expence of pickling, and they never are so good if they are gathered long before they are put into the vinegar. Fifty holes will seldom furnish more than two hundred cucumbers fit to gather at a time; and this may be repeated twice a week as long as the season lasts, which generally is five weeks. What are not wanted for pickling, may be left to grow till they become fit to eat.

Though M. Duhamel has not given us any experiments on the culture of cucumbers according to the principles of the new husbandry, there can be no room to doubt of their succeeding perfectly in that way, since M. de Chateauieux raised excellent melons, which are a much more tender fruit, in beds of common earth, in the open field, merely by keeping the ground in fine order by a judicious use of the horse-hoe, without the help of either dung, hot bed, or glasses over them, and they were, in all respects, preferable to any in his garden <sup>h</sup>. This surely merits the attention of all kitchen gardeners, and singularly of those near London, where land and labour bear extraordinary prices.

*Melons*, to have a continuation of them long, should be sown at two, or rather three, different times. The first should be in the second week of March, if the season is forward; but otherwise it had better be deferred a few days longer, because the success of these plants depends greatly on their being raised strong, which they cannot well be if the weather should prove so bad after they are come up, that a sufficient quantity of fresh air cannot be admitted to them. The second sowing should

<sup>h</sup> DUHAMEL, *Culture des Terres*, Tom. IV. p. 455.



be at the end of March; and the third, if there be a third, should be about the tenth or twelfth of April. These are the directions of Mr. Philip Miller, whose long experience and excellent observations have enabled him to treat this subject so much better than any other had ever done before him, that I cannot do justice to him, or to my readers, but by giving the substance of his judicious instructions on this head; especially as they contain several new and essential improvements.

The melons which best deserve culture are, the Cantaleupe, the Romana, the Succado, the Zatte, the small Portugal, and the black Galloway: for our common sorts, and those which most of the trading gardeners around this metropolis raise for the markets, where their size is chiefly regarded, are not worth the trouble and expence bestowed upon them, otherwise than as they bring in a profit to the cultivator.

The Cantaleupe, as it is called, by way of pre-eminence, particularly by the Dutch, who cultivate very few other sorts, and never subjoin the word melon when they speak of this, though they apply that distinctive appellation to every other kind, is held in the greatest esteem by all the curious in Europe. It derives its name from a place (where the Pope has a country seat) about fourteen miles from Rome, where it has long been cultivated: but it was first brought thither from that part of Armenia which borders on Persia, where this fruit grows naturally in vast abundance. Its outer coat is very rough, full of knots and wart-like protuberances; and its flesh, which is generally of an orange colour, though it is green in some, but these are not so good, is singularly



delicious, when in perfection, and remarkable for the safety with which it may be eaten ; for it does not offend even the most tender stomachs.

The Romana is a good melon, when it is well conditioned, and produced by a perfectly healthy plant, in a dry season. It may be ripened sooner than the Cantaleupe, and therefore merits the attention of those who are fond of having early melons.

The Succado is also a very good sort, and will yield early fruit : but neither it, nor the Romana, can be compared to the Cantaleupe, when this last is in season.

The Zatte melon is likewise well tasted ; but it's fruit is so very small (seldom exceeding the size of an orange), and the flesh in it so little, that it is scarcely worth cultivation. It is somewhat flat at both ends, and it's coat is warted like that of the Cantaleupe.

The small Portugal melon, which some call the Dormer melon, may also be cultivated for an early crop. It is a pretty good fruit, and grows plentifully ; for which reason many people, who choose quantity rather than quality, and whose palates are not nice, give it a sort of preference to most other sorts : but it falls greatly short of the Cantaleupe, in point of flavour.

The black Galloway, which was brought from Portugal, many years ago, by Lord Galloway, is the best of all melons for an early crop ; for it will ripen in a shorter time from the setting of it, than any other sort ; and it's fruit is by no means bad when it is suffered to ripen naturally. This would, therefore, certainly be a very proper sort to cultivate even in the open field, according to the principles of the new husbandry, by a proper application of which to the melon, we have just seen



seen<sup>k</sup> how well M. de Chateauvieux succeeded. The seeds of the right black Galloway are, indeed, not easily met with now in this country; because it has degenerated by growing among other sorts, the male dust (farina) of whose blossoms has been wasted to, and has impregnated, the flowers of this: for, to preserve any particular sort of melon in perfection, no other plant of a different kind, though of the same genus, no cucumber, no gourd, nor any familiar growth, should be permitted to blow near it.

To the want of care in this important, though too generally unheeded, caution, is owing the complaint of many lovers of this fruit, who, not knowing the true cause, have imputed the gradual diminution of the goodness of their melons to their having been too long cultivated from seeds saved in the same garden, and have therefore held it to be absolutely necessary to procure a frequent change of seeds from distant parts. That a change of seeds now and then is beneficial, and even advisable, is readily allowed in regard to this, as well as for all other vegetables; but the great difficulty is, to get them from people who have saved them with due care; for all hired, or otherwise mercenary, gardeners are apt to be very blameably negligent in this respect. Even Mr. Miller, though a member of the botanic Academy at Florence, and very solicitous to have the right sort, could not, for several years, procure any good seeds of the true Cantaleupe melon, notwithstanding that several parcels were sent to him, from Italy, as such, by persons who, he thought, could not be deceived in their choice, and who lived near the place of their growth. He therefore judiciously warns all persons not to depend upon seeds

<sup>k</sup> Page 168.



brought from abroad, either by those who import them for sale, or by gentlemen; and declares his own resolution, founded on repeated disappointments to be, never more to try any of them, unless he receives them from a skilful person who has himself eaten of the fruit from which he saved them: "for," "adds, he, "in Italy, Spain, Portugal, and many parts of France, the gardeners "are very careless in the choice of all their seeds, "but of the melons they are remarkably so; and "as for those which come from Constantinople, "Aleppo, and other parts of Turkey, I have "rarely seen one melon produced from those "seeds, which was tolerable."

Melon seeds should be at least three years old, and not more than six, or at most seven, when they are sown: for though they will grow at the age of ten or twelve years, and at less than three, yet the fruit produced by them will, like that of light seeds which swim upon the water when taken out of the pulp, not be near so thick fleshed, so firm, so moist, or so well tasted, as what is raised from heavy seeds kept to a proper time, even though they be taken out of the same melons. Mr. Miller has made the trial several times, and always found this to be the event.

The culture of all sorts of melons, of which there are many varieties besides the abovementioned, though not of value enough to be particularised here, is exactly the same. The two first sowings of them, that is to say, those made in March, should be under frames, and therefore these may be placed at the upper side of a cucumber bed, if there be one in readiness; otherwise a hot bed must be made on purpose for them, with new horse dung, in the manner before directed for cucumbers, like which they are to be raised and managed in all respects, till they are planted out  
where



where they are to remain. The third sowing, of which the plants are generally reared under bell or hand-glasses, or under frames covered with oiled paper, should not be earlier than the tenth or twelfth of April, lest these plants, if they thrive well, should extend their shoots to the sides of the glasses before it will be safe to let them run out, on account of the sharp morning frosts which are frequent in this country even in the middle of May: nor must they on the other hand, be cramped in the glasses, because they would then be in equal danger from the heat of the sun in the day time. If they do grow so as to exceed the limits of their glasses sooner than it may be safe to expose them to the air, the projecting ends of their vines must, in that case, be sheltered with mats, to defend them from the cold. For these reasons it is most advisable to set the seeds of such plants as are to be reared under hand glasses, a little later than those which are intended for the much more spacious coverings of oiled paper: and likewise for the same reasons, it is best, in this climate, not to attempt to have melons ripe earlier than the middle of June, from which time they may be had in plenty till the end of September, if they are rightly managed: nay, when the autumn has continued favourable, Mr. Miller has had them very good, even till the end of October.

When the beds, or, as the gardeners term them, the ridges, in which these plants are to be set to remain are of a proper warmth (but not before, lest the too great violence of the heat at first should burn the earth laid upon them), a covering of two inches thick of mould will be sufficient to begin with, except in the middle of each light, where a hill of it should be raised eighteen inches high, or more, terminating in a flat cone, in the top of which the plants are to be placed. In two  
or



or three days, this will be sufficiently warmed to receive the plants, which always succeed best when they are transplanted young; and the most proper time for removing them is the evening, when a little wind is stirring. They should be carefully taken up with a trowel, so as to preserve all their fibres, and as much earth as possible about them; for these plants are much tenderer than those of cucumbers. The Cantaleupe melon is particularly so: for it will be long before that recovers itself, after being transplanted, if this is not done soon after it has put out it's third, or what the gardeners call it's rough, leaf. If this happens before the beds are ready, the best way is, particularly for the Cantaleupe, which requires the nicest management, to take up the plants, as soon as they are fit for removing, to put each of them into a separate small garden pot, and then to plunge these into the hot bed where they were raised, or into a cucumber bed if there be room, in order that they may be brought forward; and when the bed, or ridge, where they are to remain is ready, they may be turned out of the pots, with all the earth about their roots, so as not to receive any check by the transplanting. This may be the more easily done, as only one melon plant should be suffered to grow in each light, and there will not be any danger of hurting their roots when they are removed in this way. When they are well placed on the top of the little mounts, or hillocks, before mentioned, they should be watered gently, and this should be repeated once or twice, till they have taken good root, after which more water will seldom be wanted, or advisable; because too much wet makes them canker at the root, and then they never produce good fruit. When the plants are well fixed in this new bed, a greater quantity of earth should be laid on it, beginning  
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at the hillocks, that their roots may be enabled to strike out horizontally; and as this earth is added from time to time, it should be pressed or trodden down as close as possible, till it is at last raised at least a foot and an half thick upon the dung all over the bed. The frames should also be raised in proportion, that their glassess may not be so near the plants, as to make the sun scorch them: but in this raising of the frames, great care must be taken to stop every crevice all around, so that no cold air may be able to penetrate through them.

The earth, which the Dutch and German gardeners, who are very exact in that respect, lay upon these beds, consists of one third of hazel loam, one third of the scouring of ponds or ditches, and one third of very rotten dung. They prepare this compost at least one year, but oftener two years, before they use it; frequently turning it during that time, the more thoroughly to blend and sweeten it: but Mr. Miller has found, by experience, that melons succeed best in this country when they are planted in two thirds of fresh gentle loam, and one third of rotten neats dung, well mixed and frequently turned over during one year before they are wanted, so as to enable them to enjoy all the benefit of a winter's frost and summer's heat; and of this a sufficient heap should always be kept in readiness, under a shed, well sheltered from heavy rains, which would carry off it's goodness.

When the plants have four leaves, and consequently a joint, their tops above that joint should be pinched off with the finger and thumb, to make them put out lateral branches, for these are to produce the fruit; and when there are two or three of these branches, their extremities must also be pinched off as soon as they have got two  
be



or three joints, to force out more, and these again must be treated in the same manner, that there may be runners enough, as the gardeners call them, to cover the bed. Care must be taken not to bruise the plants when the tips of their shoots are thus pinched off, nor must they be cut with a knife, because the wound will not heal soon in either of these cases. Neither should a greater number of lateral shoots than is necessary to cover the bed properly, be forced out by cropping off their ends, lest more fruit should be produced than the plant can possibly nourish. The farther management of these plants is the same as that of cucumbers, to which I therefore refer, to avoid repetitions: only it is to be observed, that melons require a greater share of air than cucumbers, and very little water; and that when they are watered, it should always be at a distance from their stems.

If the plants raised in frames succeed well, their vines will extend over the bed, and reach to the frames, in about six weeks, at the end of which the alleys between the beds should be dug up, or if there is but one bed, a trench about four feet wide should be dug on each side of it, as deep as the bottom of the bed. A sufficient quantity of hot dung should then be trodden down closely to it, till this dung is as high as that of the bed, and this additional breadth should be covered with the same sort of earth as was used for the bed. This earth should also be trodden down as close as possible, and the whole bed should by these means be enlarged to the breadth of twelve feet; for the roots of the plants will extend themselves to very near that distance: but if they should reach farther than they are covered, and their extremities be consequently dried by the sun and air, the plants themselves will gradually languish and decay,

or



or at best produce but meagre, mealy, and ill flavoured fruit; whereas those which have a sufficient breadth and depth of well trodden earth for their roots to run in, will remain in vigour till the frost destroys them. Mr. Miller has experienced the benefit of this practice so far as to have a second crop, even of Cantaleupe melons, upon the same vines as had borne the first; and that second crop has sometimes ripened very well under his judicious inspection. The languishing of the plants, for want of sufficient room to extend their roots, frequently before the fruit is full grown, and even sometimes before it is well formed, may soon be discovered by the drooping of their leaves in the middle of the day, and a then speedy total decay of many of those leaves. It is owing to their not having enlarged the beds as above directed, or even made them at all wider than they were at first, or increased the original depth of the mould upon them, which perhaps did not exceed the common allowance of about three inches, that many people have seen their plants of Cantaleupe melons pine away, and perish, before they had ripened a single fruit; and then have imputed to their tenderness, too great, say they, for this climate, a miscarriage which was entirely owing to their not understanding the right method of cultivating them.

When the vines have extended so far as to fill the frames, and consequently to want more room, the frames should be raised up about three inches above the surface of the bed, and set upon a few bricks, at that height, in order that the shoots may have room to run out under them: for if the plants are vigorous, these branches will reach to the distance of six or seven feet every way from their stem. It therefore is evidently best not to put more than one plant under each light; and



the more so as it's fruit will seldom set well if the vines are crowded, but will drop off when about the bigness of an egg. The addition of the warm dung before mentioned, on each side of the bed, will indeed, by reviving the heat of the dung in the bed, be of great service to the setting of the fruit, especially if the season should prove cold, as it sometimes is with us till the very end of May; and this is surely no small advantage accruing from that method. To second it properly, the frames for melons should not be made so small as is the general custom; for the wider they are, the better the plants will thrive, and the greater quantity of fruit they will produce.

If the weather should become cold after the plants have extended themselves from under the frames, it will be right to cover the extremities of their vines every night with mats, during the continuance of the cold; for if they are injured, the growth of the fruit will be retarded, and the plants themselves may be hurt essentially. Care should also be taken after this enlargement of the beds, that what water is given to the plants be poured only in the alleys between the beds, or towards the outside of the space added to them; for their roots will now have extended so far as to reap the benefit of any such watering, and their stems will continue the foundry for being kept dry.

This watering should be pretty plentiful when it is given; but it should not be repeated above once a week even in the driest weather: and on the other hand, the plants should be aired as much as possible when the season is warm.

The plants of melons intended to be reared under bell or hand-glasses, should be raised in the same manner as the before mentioned; and the beds, or ridges, for them should be made by the latter end of April, if the season is forward. A  
sufficient



sufficient quantity of hot dung should therefore be provided for this purpose, so as to allow eight or nine good wheelbarrow loads of it to each glass. When there is but one bed, and that is to be extended in length, the trench for it should be dug four feet wide, and it's length should be proportioned to the intended number of glasses, which should stand at least four feet asunder: for if the plants are too close to each other, their vines will intermix and entangle, and crowd the bed so as to prevent the setting of the fruit. This trench should be so situated, that there may be room for widening the bed two or three feet on each side. It's depth must depend on the nature of the soil, as was before observed: but if the ground is so dry as to obviate all danger of the bed's being hurt by wet, it cannot well be dug too deep. After the dung is spread, trodden down, and flatted in the trench, as already directed, a hill of earth (such as was before advised will be the best) should be raised eighteen inches high, with a flat head, in the middle of each spot where a plant is to be set; but the rest of the bed need not yet be covered above four inches thick; for that will be sufficient to prevent the evaporation of the warmth of the dung. The glasses should then be set down close, over the hills, that these may be warmed so as to be fit to receive the plants, which they will be in two or three days, if the bed works kindly, and then the plants should be set in the top of the hills, in the manner before directed. If they are taken out of pots, with all the earth about their roots, only one should be set under each glass, because there will not then be any danger of their growing; but if they are transplanted directly from the seedling bed, it will be right to plant two upon each hill, and afterwards to remove one of them, if they both grow.



These plants must be watered when they are first set, to bring the earth the closer to their roots. They must also be shaded every day, till they have taken new root; and if the nights prove cold, the glasses should be covered with mats, the better to preserve the warmth of the bed.

When several of these beds are made, they should stand eight feet asunder at first, that there may be between them a proper space, which is afterwards to be filled up, in order to enlarge them so that the roots of the vines may have room to extend themselves every way, for the reasons before assigned.

When these plants have taken good root, their tops must be pinched off as before directed for those in the frames; and the glasses should be raised up in the day time, in warm weather, on the side opposite to the wind, to let in fresh air to the plants, which will otherwise be drawn up weak and sickly: a state which all possible care should be taken to prevent, because their runners cannot supply the fruit with due nourishment, if they themselves have not proper strength.

If the weather be favourable, the glasses should be raised two or three inches high from the surface of the beds, and set upon three bricks, as soon as the plants are grown long enough to touch their sides, in order to give the vines room to run out from under them; but it is essential to observe, that, when this is done, the whole bed should be covered with earth to the depth of eighteen inches; that this earth should be trodden down as close as possible; and that, if the nights should prove frosty, a covering of mats should be carefully spread over the beds, to guard the tender shoots of the plants from the cold. It is also to be observed, with regard to the Cantaleupe melon in particular, that, as the vines of this sort cannot



cannot endure wet, the beds where it grows should be arched over with hoops, to support the mats, and that these should be held in readiness to be used at a moment's warning, either against cold or rain: for this is the only way to have these melons succeed in so variable a climate as our's is. Mr. Miller gives a striking instance of the necessity of this precaution, when he says<sup>1</sup>, that he had some beds of Cantaleupe melons in as fine order as could be desired, under these glassess, and that they were totally destroyed by one day's heavy rain in June.

If the weather should prove cold after the bed is covered with the proper thickness of earth, well trodden down, it will be advisable to dig a trench along each side of it, or, if there are more beds than one, to dig out their intermediate space, then to fill this, or the trenches, with hot dung, up to the height of the dung of the adjoining bed, and to cover this dung with an equal depth of well trodden down earth, as before directed. This new dung will revive the warmth of the former beds, and soon make the plants shew their fruit. The watering of them, pinching off their tops, and, in short, every other part of their management, must be the same as before directed for those under frames: but a farther care requisite here is, to cover them with mats in all hard rains and cold nights. If all this is rightly performed, these plants will remain vigorous until the cold in autumn destroys them,

The oiled paper coverings are a late invention; but they have been found to succeed admirably well when rightly managed. The chief thing to be attended to when they are used, is, not to keep them down too close over the plants; for then

<sup>1</sup> *Gardener's Dict.* Art. MELO.



the melon vines will waste themselves by running out in length, and will be so weak as rarely to set their fruit in any plenty. The best way therefore is, where these coverings are intended to be used, to raise the plants under bell or hand glasses, as before directed, till they are grown large enough to be released from those glasses; and then, instead of mats, to use this oiled paper covering, which, if it be prudently managed, will answer every end that can be desired.

To make this covering, a number of sheets of strong, but not too dark coloured, paper should be pasted together so as to over spread the frame intended to be used; and these should then be fastened to the frame, and rubbed well over with linseed oil, which will dry soon; for all the stench should be gone off before it is put over the plants, because they will otherwise be hurt thereby. Pantile laths put together in the shape of the ridge of a house, with hinges to each slope, whereby any of the pannels may be raised at pleasure, to let air in to the plants, are the best materials, and the best form, for these frames; for when they are made with broad hoops, like the tilts of waggons, they are cumbersome to move, and no air can be admitted to the plants, but by raising up one whole side of the frame; which is very inconvenient.

When the vines begin to put forth their fruit, which they will do in plenty soon after the bearing runners shall have been produced by nipping off, in the manner before advised, first the top of the plant, as soon as it has one joint, and then the ends of the earliest lateral shoots when they have two or three joints, they should be carefully looked over thrice a week, to observe the setting of the young melons, and single out, upon each runner, that only which seems to be the strongest fruit, which has the thickest foot-stalk, and which



is situated nearest to the stem. All the others should then be pinched off; and the end of the runner upon which a melon has been thus chosen should also then be nipped off at the third joint above the selected fruit, to stop the sap and set the melon: but none of the ends of these bearing runners should ever be broken off before the particular fruit has been culled out, because that would only make them produce more shoots, which would weaken the plant, and draw away the nourishment necessary for the fruit. For this reason, if any new shoots do break out, or any young fruit appears, after the above precautions in favour of that which is intended to remain have been taken, they should be nipped off immediately; for if many of them are suffered to grow, they will absolutely impoverish the plant to such a degree, that it would not be surprizing to see all the fruit drop off when it comes to be about as big as a man's thumb. One young melon is as much as ought to be left upon any one runner; for, if but half of these stand, they will be full as many as the plant can nourish. Six or eight of the Cantaleupe's, whose flesh is thick, are full enough for the strongest plant of that kind; and though some smaller sorts may be ripened in greater numbers, even unto fifteen or twenty upon one plant, they will be thinner and poorer than if they were less numerous.

For plants which are so confined under frames, that the wind requisite to convey the farina from the male flowers to the female is excluded, it is the practice of several gardeners, and perhaps it may there be even a necessary one, to take off some of the male flowers whose farina is just ripe and fit for the purpose, and, inverting them over the female flowers situated on the crown of the young fruit, to strike the former gently with the tip of



a finger, so as to shake it's farina into the latter; for by this means the female flower will almost surely be impregnated, and if it is, it's fruit will swell soon after, and shew manifest signs of being perfectly set: but, from the time that the fruit appears on the vines, the glasses should be constantly taken off in good weather, or the fruit will seldom form in any plenty.

As the melons draw towards ripening, (long before which all the superfluous fruit and weak runners will have been pinched off, if they are properly managed,) they should be turned gently twice a week, that every part of them may receive equal benefit from the sun and air; for if the same side is suffered to lie continually downward, in which situation it will be deprived of both those advantages, that side will become pale, or whitish, as if it were blanched.

Besides airing the plants as much as possible when the weather will permit, they will also require to be watered in very dry weather, and perhaps most particularly after they have been pruned: but this, as was before observed, should be done with great care not to wet their stems, by pouring the water only in the alleys, at a distance from them: nor should it be repeated oftener than once in a week or ten days. Then, indeed, the alleys should be well soaked, to forward the growth of the fruit, and render it thick fleshed: though it is essentially necessary not to over-water the plants.

The goodness of all melons depends greatly on their being cut at a proper degree of maturity. The Cantaleupe, in particular, is so very nice in this respect, that it will lose much of it's delicacy if it be left but a few hours too long upon the vines. The beds should therefore be looked over at least twice every day when the fruit is ripening; and if those which are intended for the  
table



table are cut early in the morning, before the sun has warmed them, and laid by in a cool place till they are used, their flavour will be much better than if they are gathered later in the day, and served up directly. Such as are cut afterwards, when the heat of the day has affected them, should be put into a pail of cold spring water, or ice, to cool them, before they are set upon the table.

A sure sign of maturity in the Cantaleupe melon is, it's beginning to crack at the foot-stalk, and to emit a fragrant smell. Whenever this happens, the fruit should be cut directly; for this sort seldom changes it's colour as the others do, and only a few hours delay will render it too ripe, as was before observed.

The best seeds of melons are those which are taken from the firmest and highest flavoured fruit; and if they are scooped out with the entire pulp, so as not to displace them, and left in it for two or three days before they are washed out, they will be benefited thereby. None but the heavy seeds, which sink in the water, are worth saving.

*Mushrooms* of the right eatable sort, which it is of importance to distinguish well from several noxious kinds that have been productive of even fatal accidents, appear at first with a roundish head, not unlike to a button. The outside of this head is then very white, as is likewise the stalk on which it grows; but it's under part, when it is taken off that stalk, from which it separates pretty easily, is of a livid flesh colour. It's flesh is also very white within. If this sort remains undisturbed, it's head will spread to a considerable size, and open, at the bottom, so as to form an almost flat surface, the under part of which will then be changed to a dark colour.



Most of the writers upon gardening have spoken so confusedly, not to say, of most of them, so unintelligibly, of the means of propagating this plant, that, excepting the authors of the *Maison rustique*<sup>m</sup>, and Mr. P. Miller, one is sometimes puzzled to guess at their meaning. The account which this last has given in his dictionary<sup>n</sup>, is the most practical, being the method of the gardeners near London, who raise annually great quantities of mushrooms for sale. The substance of it is to the following effect.

The spawn of mushrooms, from which only they are propagated, looks like a white mouldiness shooting out in long strings. It is frequently found among the dung of old hot beds, or in old dung-hills, especially when much litter has been mixed with these last, or the wet has not penetrated so as to rot it; or it may be procured by mixing some long stable dung, which has not been thrown up in a heap to ferment, with strong earth, and then laying this mixture under cover where it cannot be wet, and where the air may be excluded from it as much as possible; for, the more effectually it is kept from air, the sooner the spawn will be produced. It will generally appear in about two months, if the heap has not been laid so close together as to heat (for that will destroy the spawn), and especially if it has been well covered with old thatch, or litter which has lain so long abroad as to have lost the power of fermenting. These are expedients by which the spawn of mushrooms may be procured at almost any time, by those who have not already had mushroom beds in their gardens, and therefore cannot collect it from their remains: for there are but two months

<sup>m</sup> Tom. II. p. 110.

<sup>n</sup> Art. MUSHROOMS.



of the year in which it can be gathered from downs or pastures. These are August and September; when plenty of mushrooms spring up naturally in many of those places. To propagate them from thence, the ground should be opened about their roots, and such earth as is there found full of small white knobs, which are the offsets, or young mushrooms, should be attentively gathered up, with as much care as can be not to break the lumps, or the earth about them. This seed, or rather this spawn (for if mushrooms have seeds, they are imperceptible to the eye), should be kept very dry till it is used; for the drier it is, the better it will take to the bed, as has been remarkably experienced by Mr. Miller, who declares, that he never saw these plants produced so soon, or in so great quantity, as from a parcel of their spawn which had lain near the oven of a stove for upwards of four months, and was become so dry, that he despaired of it's success.

The beds for mushrooms should be made of dung plentifully intermixed with litter, but not thrown in a heap to ferment. The best dung for this purpose is that which has lain spread abroad for a month, or longer. Their breadth should be about two feet and an half at bottom, their length proportioned to the desired quantity of mushrooms, and they should be made on dry ground, by spreading upon it, first a layer of dung about a foot thick, and upon this about four inches deep of strong earth; then a couch of dung about ten inches thick, and upon that another layer of earth, contracting the surface of the bed all the way up, till it terminates like the ridge of a house. This may be done with three layers of dung, and as many of earth. When it is finished, it should be covered with litter, or old thatch, as well to prevent it's drying, as to keep out wet, and after it

has



has remained eight or ten days in this situation, it will be of a proper temperature to receive the spawn, for which it's warmth should be but moderate. The thatch, or litter, should then be taken off, the sides of the bed should be smoothed, and a covering of light rich earth, by no means wet, should be laid all over it, about an inch thick. Upon this the spawn should be placed, by laying it's lumps about two or three inches asunder, in such manner as to prevent their slipping down, and then the whole should be covered gently with about half an inch thick of the same light earth as was used before. The covering of litter should then be re-placed over the bed, so thick as to secure it from wet, and to prevent it's drying. If these beds are made in the spring or autumn, when the weather is temperate, the mushrooms will frequently come up in a month's time: but those which are made in summer, when the season is hot, or in winter, when it is cold, will not produce them near so soon. Sometimes too it happens that neither of these beds, but most particularly those made in the summer or winter, yield any mushrooms before the end of five or six months; and that they then produce uncommon quantities, and continue in perfection for a long time.

The great art in managing of these beds is, to keep them constantly in a due degree of moisture; and, above all, not to suffer them ever to receive too much wet; for that would inevitably destroy the spawn of the mushrooms. During the summer, they may be uncovered, to admit gentle showers of rain to them at proper times; and if the weather continues dry for a long while together, it will be right to water them gently now and then, but by no means to over-do it. During the winter, they must be kept as dry as possible,  
and



and closely covered, lest the cold air of that season should injure them. It will even be right, in frosty or very cold weather, to lay over them a covering of dry litter, for it must not incline to ferment, and upon that some warm litter shaken from out of a heap of dung. This covering should also be renewed as often as it is found to decay, and it's thickness should be increased if the cold grows more severe.

The mushrooms thus produced have a finer flavour than any that are gathered in the fields; and if the above directions are observed, they may be had in plenty during the whole year: for each single bed will continue good for several months, and yield great quantities, if the spawn takes kindly.

When these beds are destroyed, the spawn for a fresh supply should be taken from them, and laid up in a dry place until the proper season for using it, which should not be sooner than five or six weeks, in order that it may have time to dry well before it is put into the new bed; for otherwise it will be apt not to succeed.

*Purslane* is raised upon a hot bed by those who would have it among their early sallots; for it is too tender a plant to be sown in the open air before the month of April, and even then it must be placed in a warm situation: but it is of so very cold a nature, that it cannot be safely eaten in this country, except in the heat of summer, during which a supply may be easily had by sowing it upon common beds of light rich earth, at three or four different times, about a fortnight or three weeks distant from each other. I say, by sowing it upon these beds, because it's seeds, which are very small, should be sprinkled extremely thin over the ground, and then only patted down gently with the back of a shovel, so as just to prevent their be-  
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ing blown away. The plants, which will rise in a few days, will require no other culture than keeping them free from weeds, and watering them two or three times a week in dry weather; for purslane delights in somewhat more than ordinary moisture. In about six weeks after sowing, they will be fit for use.

The green leaved, and the red or yellow leaved, commonly called golden purslane, are but varieties of the broad leaved, or garden purslane, which is the only species cultivated in our kitchen gardens.

The seeds of purslane are saved from some of the earliest and finest plants, which are left for this purpose, whilst all the weak or small leaved ones about them are rooted out. When they are ripe, the stalks which bear them should be cut down, spread upon cloths, and dried in the sun during three or four days; housing them each night. They should then be beaten out, sifted, cleaned, and laid up in a dry place. Some are of opinion, that the seeds of purslane are best when they are about three years old; but that seems to be a mistake.

*Some general Cautions proper to be observed in regard to the Kitchen Garden.*

**T**HE best seasons for bringing garden ground into good order, either by trenching it, or by giving it a thorough digging, are the autumn and the spring. The former should be performed pretty early in November, for the next spring sowings; and that which is to be sown in the autumn, should be dug in May; in order that the winter's frost and snow in the former case, and the summer's heat in the latter, may the more effectually mellow and loosen the soil, and kill the weeds. For this last purpose, in particular, the weather cannot be too hot, nor the earth too dry.



A compost of earth and well rotted dung should be kept always ready, in a remote corner, under such shelter as will preserve it from heavy rains and other inclemencies of the weather; to be used when occasion may require, for earthing up of some plants, sifting over some of the smallest sorts of seeds, laying upon hot beds, or other similar purposes. The remains of old hot beds are excellent for this use; and therefore they should be laid by carefully.

The beds in which the plants are sown, or set should not be wider than one can reach half way across, in order to weed them, rake them, and keep them in due order. Narrow foot-paths, at least, should therefore be left between them, wherever they occupy any considerable part of the garden.

It is best to sow, or plant, in a dry light ground in autumn, and in a moist soil in the spring of the year.

A pleasing, and perhaps useful, regularity will be preserved in the garden, by setting, so far as can be conveniently done, all the durable plants in one quarter, the salleting in another, the asparagus in a third, and so on. If the garden is large, it will be a means of saving some time, and trouble, to those who are to gather them.

Particular care should be taken to have a constant and regular succession of crops; and to order them so that no part of the ground may ever remain long unoccupied.

Most herbs of the esculent kind grow the stronger, take the better root, yield the fairer leaf, grow the sweeter both in smell and taste, endure the winter better, and are in some measure prevented from becoming sticky, or running to seed, by a moderate plucking or cutting off, of the tops of their shoots and branches. Their maturity  
is



is accelerated by early sowing, or planting, in warm exposures, or by the means of hot beds, as before directed; and it is retarded by frequent transplantation, because their roots cannot, in this last case, put forth new fibres, to collect their nourishment, till several days after their removal.

The seeds of plants, in general, should not be watered till they have lain forty eight hours in the ground, by which time the earth will be settled about them, and they will have imbibed some of it's moisture: for much water, before that, coming upon them at once, will be apt to make them burst. They should be sown deepest when the ground is driest: but an almost universal rule, is to proportion the depth of the sowing to the size of the seed.

It is better to water a plant seldom and thoroughly, than often and slenderly; because a superficial watering serves only to make it root shallower than it would otherwise do, and thereby renders it the more liable to be affected by the weather. But, at the same time, care should be taken not to pour the water on too hastily, or in too great quantity, for fear of chilling the plant, or perhaps rotting it's root, and of washing away the finest, and therefore most nutritive, particles of the earth.

All plants should be watered carefully when they are first removed; and most of them will require it also in extremely dry seasons, unless they are cultivated according to the principles of the new husbandry: but care should be taken not to wet the leaves of any that are young and tender, and to water only the earth about them, whilst the weather is cold. Even those plants which are of a more hardy kind, or their seeds newly sown, should not be watered but in the forenoon, so long as the nights are cold. When these are warm, and  
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the days hot, the evening is the most proper time for watering them.

All seeds should be gathered in dry weather, when there is not any moisture upon them; and the best way to preserve them is, to hang them up in bags, in a dry room, where vermin cannot come at them. The temperature of this place should be moderate; lest either too much warmth, or a too strong current of air, should make them dry, and consequently decay, sooner than they would otherwise do: and at the same time care must be taken not to exclude the air totally from them; it having been repeatedly experienced, that seeds kept long in bottles closely stopped have entirely lost the power of growing. They will keep longest in their pods, when they can be so laid up, because those coverings not only defend them from the injuries of the outward air, but, so long as they are not disjoined from them, continue to supply them with a degree of nourishment which helps to maintain them in a plump state, fit for vegetation. The seeds of all soft fruits, such as cucumbers, melons, &c. are of course excepted from this general rule; for they must be well cleansed from their surrounding pulp, the rotting of which would otherwise soon corrupt them. Those of melons in particular, are so far benefited by being kept in a warmer state than would suit any others, that the plants produced from them are thereby rendered the less luxuriant, and therefore more fruitful: for which reason it is that many people carry them in an inner pocket of their breeches for six weeks or two months before they sow them, in order to exhale part of their moisture; and in effect, this will weaken them as much as two years keeping them in the common way.

Those seeds which swim upon the surface of water, when they are put to that trial of their



goodness, should be rejected for sowing; because, as hath already been frequently observed, though many of them will grow, they never produce so good plants, or so fine fruit, as the fuller, plumper, and more perfect ones, which sink to the bottom.

The age at which it is best to sow the seeds of the plants before treated of, and the time to which they will keep good, are thus ascertained by Mr. Miller<sup>o</sup>, after many years experience and very accurate observation.

The seeds of asparagus, basil, beans, beet, borage, capficum, carrots, celeri, chervil, cresses, endive, fennel, finocchia, hyssop, kidney beans, lavender, leeks, lentils, marjoram, marigolds, onions, parsley, parsneps, peas, purslain, radishes, savory, skirrets, spinnage, thyme, and turneps, are best sown the first spring after they have been saved; and indeed many of them will not grow if they are kept longer.

Those of cabbages, colliflowers, endive, lavender, lettuce, mustard, and sorrel, will not be the worse for keeping two years, if they are well preserved; though all of these are equally good for use the first year.

The seeds of cabbages, cucumbers, lettuces, melons, and favoys, will grow very well at the end of three years, if they have been properly saved and kept. Some of them, and particularly those of cucumbers and melons, are generally reckoned best when they are three years old; because, when they are new, the plants produced by them will grow too vigorous, and yield but a small quantity of fruit. However, none of these seeds should be kept longer than four or five years, though they will grow at the end of nine or ten: but then their plants will be weak, and their fruit small.



The seeds of fennel will frequently remain in the earth a whole year, especially if they are sown in the spring; so that whenever the plants do not come up the first year, the ground should be left undisturbed till the following spring, except only keeping it clear from weeds, and the plants will then appear.

## S E C T. II.

## OF THE FRUIT GARDEN.

**T**HE useful and the agreeable concur to recommend this branch of cultivation by so much the more strongly, as the plants which appertain to it, being perennials, require only occasional care, little trouble, and hardly any expence.

In my division of this subject, I shall begin with shewing how the best stocks for fruit trees are to be raised in the Seminary and Nursery: I shall then point out the most approved methods of preparing them to yield their respective fruits in the greatest perfection, by means of grafting, budding, &c. Their management when planted against Walls, in Espaliers, and when reared as Standards, will be spoken of next; and I shall close this Section with an account of such fruit-bearing Shrubs as merit the attention of a good husbandman. The Orchard will, of course, claim the ensuing Section, and the then next place will be due to the Vine, now an object of great importance to our colonies. This will naturally lead me to the making and managing of Wine, Cyder, Perry, Beer, and such other liquors as are rendered wholesome and palatable by means of fermentation.



## ARTICLE I.

*Of the Seminary and Nursery for Fruit-Trees.*

**T**HE person who has a Seminary and Nursery of his own enjoys the advantage of not being obliged to buy, at every turn, the trees which may be wanted to repair the loss of those that fail, perish, or become worn out, in his garden, orchard, or other plantations: he is much surer of the sorts and qualities of those which he sets, than he could possibly be if they were purchased from even the most careful nursery-men who raise them for sale; because most of these, having dealings with each other, procure from their friends what they have not themselves, and therefore cannot be entirely relied on in these matters, how great soever their probity may be in other respects; and, which is a circumstance of no small additional importance, his plants are already accustomed to the soil and situation in which they are to grow.

This spot should be situated conveniently for water, and at no great distance from the dwelling house, in order that the master, whose frequent inspection is absolutely necessary, if he expects it to prosper, may the more easily visit it at all times of the year. It's exposure should be to the south or south-east; and besides being well sheltered by distant trees, to break all strong winds, particularly from the north and west; it should be so carefully inclosed, that no cattle, or vermin, may be able to get in; for they would make sad havock among the young trees, especially in winter, when the ground is often covered with such depth of snow, that they cannot readily come at grass.

Hares



Hares and rabbits must be guarded against with the utmost caution; for they are great destroyers of young trees in that season, by gnawing off their bark. The soil should be of a middling nature, neither too wet, nor over dry; though, of the two extremes, dry is to be preferred, because, if trees do not grow so fast there as they do in moist ground, they are generally sounder and more disposed to fruitfulness: neither should it be in any respect better than that into which the trees are to be transplanted to remain: it should be fitted thereto; and the degree of warmth should also be the same, as nearly as possible. It is chiefly for want of observing these last precautions, that the trees raised in the rich dunged nurseries near London, and sent from thence into the country, perhaps to the northern parts of England, where they are planted in a poorer soil and colder situation, are frequently at a stand, or make but very little progress, for three or four years after their being removed.

The ground should be well trenched to the depth of eighteen inches, or rather two feet if the staple will admit of it, in August or September; and if it be suffered to lie rough all the winter, it will be greatly benefited thereby. In this trenching, it should be thoroughly cleared from all large stones, which would otherwise fret and gall the roots of the young trees; and from weeds, particularly such as couch grass, docks, &c. lest they should entangle with those roots, so as not to be extirpated afterwards, and over-run the ground, to the prejudice of the plants intended to be reared; for they should be kept as clear as possible from weeds during the whole time of their growth. Another good digging in the spring will prepare it to receive such seeds as are to



to be sown then; and a digging or two more, in the ensuing summer, will fit it perfectly for those that are to be planted in the next autumn. Just before either of these sowings, or plantings, it must be levelled and raked as even as possible, and laid out in beds, with paths between them, proportioned to their respectively intended uses. As many of these as may be requisite should be allotted for the Seminary, at one end of this spot, and the rest should be reserved for the Nursery. The beds should be about a yard wide, and the intermediate spaces sufficient for a person to go conveniently between them, in order to sow, set, and weed the plants.

All stocks for fruit trees should be raised from the kernels or stones of the fruit; for suckers (though some people use them), besides being hardly ever well rooted, are very apt to produce quantities of other suckers, which weaken the trees exceedingly, and become very troublesome in the borders and walks of a garden. The best way therefore is to sow a few stones and kernels annually, or at least every other year, for a constant supply. Both these sorts of seeds are best when their fruit has been suffered to hang upon the tree till it drops through ripeness, and is afterwards permitted to begin to rot: but they must be carefully taken out before that rottenness can affect them. They should then be well cleared from the pulp, and the largest, plumpest, and heaviest should be selected, and carefully laid up in dry sand, in a place where neither vermin nor moisture can come to them; for the latter would spoil their growth by rendering them mouldy, and the former, particularly rats and mice, are so very fond of the kernels of apples and pears, that they will even scratch them up after they are sown, and then devour them. Traps should therefore be set in the Seminary, to catch those mischievous animals.

Layers,



Layers, slips, and cuttings, when they have taken good root, make far better stocks for grafting on, than any suckers; but still they are much inferior to those which are raised from seeds.

The best stocks for each sort of fruit are the following.

For *Apples*, which must always be grafted upon a free stock, that is to say, upon a stock of their own kind, for they will not take upon that of any other fruit, the sorts most generally used are,  
 1. The Crab stock, as it is commonly termed;  
 2. The Dutch Creeper; 3. The Paradise stock;  
 and 4. The Codlin stock.

The first of these, called likewise free stocks, are usually raised from the kernels of all sorts of apples taken indiscriminately from the cyder-press; and as all the trees of this species are, without distinction, termed crabs before they are grafted, these are called by the general name of crab stocks: but the best, particularly for such apple trees as are intended for standards, are raised from the kernels of real wildings, or crabs, which have been pressed for verjuice; for these are always cleaner, freer from canker, more durable, and less luxuriant in their growth, than any that are raised from the kernels of finer and sweeter apples. They also produce the firmest, most juicy, and best tasted fruit, as well as the fittest for keeping, and will preserve the sorts grafted upon them in their true size, colour and flavour, far better than any of the other sorts of free stocks. These last will, indeed, produce larger fruit; but it will not be so well tasted, or keep near so long. For winter apples in particular, the true crab stock is incomparably the best. In short, it is remarkably with this, as it is with all other fruits, that, the sourer the stock is, the better it's produce will be.

The second sort of stocks for apples, called the Dutch paradise apple, Dutch stock, or Dutch  
 N 4 creeper,



creeper, is generally preferred for espaliers, or dwarfs, because it is easily kept within the compass usually allotted to those trees, without stinting the graft too much; nor does it decay, or canker, near so soon as the third sort, commonly called the dwarf paradise apple, which is now raised only for very small gardens, or for the curiosity of setting an apple tree upon the table with it's fruit upon it, which never is at all numerous.

Codlin stocks are used by some, in order to stint the growth of their grafts: but as they never produce firm or lasting fruit, they should be absolutely rejected, at least for all winter apples, and especially if they have been propagated by suckers, as is the common way. Even the Codlin tree itself is so much improved by being grafted upon a crab stock, that it becomes much more durable than it would otherwise be, ceases to put out suckers, and produces firmer and tarter flavoured fruit, which is also much fitter to keep.

November and December are proper times for sowing the kernels of apples in dry ground; but where the soil is wet, it is best to wait till February. The most regular and most convenient way of sowing them, in order to facilitate the taking up of the plants, is to drop them, but not too close together, in little channels opened across the bed, (which, it is taken for granted, has been well dug, raked, and properly prepared as before directed), and then to cover them with about half an inch deep of the same mould. The plants will come up in the spring, when they must be carefully weeded; and if the season should prove dry, it will be right to water them twice or thrice a week. The weeding of them must be continued during the whole summer, lest they should be choaked, or stunted in their growth; and if they thrive well, they will



will be fit to transplant into the nursery the next October; at which time the ground that is to receive them should be dug again thoroughly, and carefully cleared from all weeds.

The best stocks for all sorts of firm winter *Pears* are raised from the kernels of the fruit of which Perry has been made, or from the seeds of some of the strongest and quickest growing summer pears, such as the Lady's thigh, and the Windsor. These kernels, if sowed as before directed for apples, and afterwards sown, in the same manner, early in the spring, will come up in about six weeks; and if the plants thus produced are kept clear from weeds, they will be strong enough to remove from the seed bed into the nursery in the ensuing month of October. But for all sorts of soft melting pears, which are in general the summer and autumn fruits, quince stocks are preferred, especially for a strong soil, or for such trees as are designed for dwarfs or walls; because the luxuriance of their growth is checked by these stocks, and their shoots are more easily kept within due compass, than they can be when grafted upon free stocks. They must not, however, be used indifferently for all sorts of pears; first, because there are some which will not thrive upon them, but will decay in two or three years, or at most but just keep alive; and secondly, most of the sorts of hard, or winter pears, are rendered stony by being grafted on a quince stock: besides which it is to be observed, that no sort of pear will do upon quince stocks in very dry and gravelly ground. These stocks are often propagated from suckers, which may be obtained in great quantities, by cutting down an old quince tree: but, for the reasons before assigned, they are not near so good as those which are raised from well rooted layers or cuttings.

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The white thorn was formerly used as a stock to graft pears on; but it is now almost totally laid aside for that purpose, because it never keeps pace in it's growth with the fruit grafted or budded upon it; and also because the fruit which it produces is generally dryer, and more apt to be stony, than that which grows upon pear stocks.

*Cherries* do best when grafted upon stocks raised from the stones of the common black, or wild red cherry, both of which are strong growers, produce clean stocks, and are more lasting than any of the garden kinds. These stones, collected from the ripest and almost rotten fruit, may be sown in the autumn in a bed of light earth; or they may be kept in sand till the spring, and be sown then. The plants produced by them must be kept carefully clear from weeds, and watered from time to time in dry weather, as before directed. They should remain in the seed bed till the second autumn after sowing, and will then be fit to transplant into the nursery, in October. Stocks of the Cornish, and of the Morello cherry, likewise raised from the stones, have also been used with success, to render the trees more fruitful and less luxuriant in their growth; for in these last respects they have nearly the same effect upon cherries, as the paradise stock has upon apples.

*Plums* will not do upon any but Plum stocks, the best of which are raised from stones of the freest growing sorts, such as the muscle, the white pear-plum, &c. These stones should be set in autumn, about three inches deep and four inches asunder, in a bed of light dry earth, which it will be right to cover in the winter with a little dry straw, or haulm, to protect them from the frost; for that would destroy them, if it were to penetrate deep into the ground. Their plants will come up the next spring, when the covering of litter should be



be carefully removed; and if they are watered sparingly now and then in the spring and summer, and kept constantly clear from weeds, they will be fit to remove from the Seminary into the Nursery in the then ensuing spring, or, which is more eligible, in the following autumn.

All the late, or autumn *Peaches*, which are the hard sorts, and all *Nectarines* and *Apricots*, succeed best upon stocks of the muscle, or of the white pear-plum, raised from the stone; though any of the large growing plums, whether white or red, will afford very good stocks for these fruits. Some recommend almond and apricot stocks for the early, or summer peaches (commonly distinguished by the appellation of melting peaches), which will not grow upon plum stocks: but the almond stocks are so tender in their roots, so apt to shoot too early in the spring, and of so short duration, that the preference is deservedly given, for these kinds, to the apricot stock, upon which they will take perfectly well, without being near so subject to blight, as upon the almond. These stocks are raised, and managed, in the same manner as those of the plum. They are particularly proper for all sorts of Peaches which are planted in a dry soil; because the peach seldom does well in such ground, if it be grafted on any other stock; but the Apricot will thrive there exceedingly. For this reason, the common practice of the nursery gardeners is, to bud the plum stocks either with apricots, or some free growing peach, and after these have grown a year, they bud the tender sorts of peaches upon their shoots; by which means many sorts succeed well, which would scarcely keep alive in the common way. The gardeners term these double worked Peaches.

The stones of Peaches are not worth setting for stocks to inoculate, unless it should be for almonds; because



because the plants which they produce are of a spongy nature, and will neither last, nor bear transplanting. They may, indeed, produce some new sorts of peaches, if they are neither budded nor grafted (for all the varieties of fruits have been originally obtained from their seeds); and these may be better suited to our climate, than such as are brought from warmer countries: but so few fruits raised in this manner prove better than those from which the seeds were taken, that they seldom make amends for the trouble of rearing them. However, if any, who have ground to spare, choose to try the experiment, I will suppose with peaches, their best way is to plant the stones of those sorts only which ripen pretty early, which have a rich vinous juice, whose flesh is firm and cleaves to the stone, and of which the fruit has been suffered to remain upon the tree till it has dropped off, through ripeness. If a superior sort chances to be thus obtained, it may be easily multiplied afterwards by budding it upon proper stocks; for budding, or inoculating, is the best way of propagating all stone fruits.

When the plants raised in the Seminary are fit for transplanting into the Nursery (the most proper time for which is the month of October in the next ensuing autumn after their being sown), the earth about them should be carefully raised with a spade, in order to preserve their roots as entire as possible. The very small fibres of those roots should then be pruned off, and if any of them have a tendency to shoot downright, they should be shortened, in order to make them strike out horizontally. A line should then be drawn across the ground intended to be planted (the spot having been previously well dug and loosened), and an exactly strait trench being opened with a spade, the plants should be set therein as upright as possible; after



after which the trench should be filled up, and the earth trodden gently down to their roots, with as much care as can be not to displace their stems so as to render the row crooked. If they are designed for dwarfs, the distance of a foot from plant to plant in the rows, and of three feet from row to row, will be sufficient; but if they are intended for standards, the rows should be at least three feet and an half or four feet asunder, and the plants should not be nearer to each other than a foot and an half in the rows. By allowing these spaces in the nursery, the wood of the stocks will be better ripened, and rendered more compact, than that of those which grow close together, and are thereby drawn up to a greater height. The wood of these last will be soft, and so very porous, that the cions grafted into them will shoot too vigorously to be able to produce much, or good fruit; and when trees have acquired an ill habit at first, it is very difficult to reclaim them afterwards. In this transplanting into the nursery, none of the stocks should be headed, or pruned at the top, because that would weaken them, and force out lateral branches which would spoil them.

If the winter should prove very cold, it will be proper to spread some dry straw, or haulm, upon the surface of the ground, near the roots of the plants, for a safeguard to their tender fibres, which would otherwise be in danger of being hurt by the frost: but care should be taken not to lay it too thick about their stems, or to let it remain there too long, lest it should deprive the plants of the moisture necessary for their growth. It should therefore be taken away as soon as the frosts are over.

In the summer, all weeds should be hoed up, and destroyed, as fast as they appear; and the ground should be dug between the rows at least every



every spring, or rather twice a year, *viz.* in October and March, the more effectually to loosen it so that the roots of the plants may easily strike out their fibres on every side. Care should also be taken to rear the stocks as smooth and as upright as possible, by rubbing off their side buds as soon as they are observed, or pruning off such shoots of that kind as may have escaped the notice of the gardener at their first coming out.

If the stocks grow well, such of them as are intended for dwarfs will be fit to graft or bud after they have stood two years in the Nursery: but those which are designed for standards will not be tall enough until the fourth year; for these should be budded or grafted near six feet from the ground, or else the graft will not advance much in height; nor is it possible to make a good standard from a low grafted stock, unless the graft be trained upward.

## A R T I C L E II.

### *Of Grafting, and of Inoculating, or Budding of Fruit Trees.*

**A**FTER a few general directions relative to this branch of gardening, by which alone there can be a certainty of having the exact kinds of fruits which are desired; I shall explain, as clearly and as concisely as I can, the most approved methods of performing the business, first of Grafting, in all it's different ways, and then of Inoculating, or Budding.

The reason for grafting, or inoculating, is, that as all good fruits have been accidentally obtained from seeds, so these, when sown, will often degenerate, and produce such fruit as is not worth cultivating:



cultivating: but when the shoots, cions, or grafts, as they are called, are taken from such trees as yield good fruit, these will never vary from their kind, whatever be the stock, or tree, on which they are grafted.

These cions, or grafts, should always be shoots of the former year, for older ones never succeed well. They should be taken from the best bearing branches of the healthiest and most fruitful trees, rather old than young, and whose wood is most compact. The shortest jointed, most stumpy, and fullest of buds, make the best grafts; and those which are cut from lateral or horizontal branches should be preferred to such as are taken from strong perpendicular shoots. Care must be taken not to cut them from a sickly tree, because they will long retain, and sometimes never get the better of, any distemper derived from their mother-plant: nor should they be taken from a young luxuriant tree, whose vessels are generally large; because they also will, in that case, continue to produce luxuriant shoots, which seldom afford much fruit. The length of the graft, or rather the number of buds left upon it, should, in a great measure, be regulated by the more or less thriving state of the stock, which will accordingly be able to yield more or less sap to nourish it: but, generally, three or four buds are sufficient for any graft, and two of them are enough in most cases.

These grafts, or cions, should be cut off from the trees just before their buds begin to swell, which is generally three weeks or a month before the season for grafting. They should then be laid in the ground with their cut end downward, so as to bury them half their length; and their tops, which must not be shortened till the grafts are used, should be covered with dry litter, to prevent their



their being withered by the air: though Mr. Worlidge says <sup>p</sup> that many excellent grafters had assured him, that the graft which seemed withered, and fit to be thrown away, has proved the best when tried; and that a graft a little withered and thirsty, is the better received of the stock. Certain it is, that a graft which has been cut some time before it is used, and kept in a due state of moisture, by being stuck into the ground, or into clay, will take better than one that is grafted as soon as it is cut. If a small joint of the former year's wood is cut off with the cion, this last will be the better preserved; and that joint of old wood may be pared away at the time of grafting the cion, which is to be reduced to a proper length, or number of buds, before it is inserted in the stock <sup>†</sup>. If the cions are to be carried to a considerable distance before they are grafted, their cut ends should be put into a lump of moist clay, or stuck into a turnep, and the whole of them should be wrapped up in moss. By this means they will keep fresh for a month, or longer. But it is to be observed, that such as are to be carried far should be cut in proportion earlier from the trees, than those which are to be grafted upon, or near, the place of their growth. Mr. Mortimer had Pear-grafts from Paris, which grew perfectly well<sup>q</sup>. If they are any thing dry when received, they may be easily recovered, by laying them in water a few hours, and afterwards sticking them in moist earth.

<sup>p</sup> *Systema Agriculturae*, c. 7. §. 5.

<sup>q</sup> *Art of Husbandry*, Vol. II. c. 3.

<sup>†</sup> Mr. Mortimer mentions his having been told, that a cion grafted with the top on, will bear sooner than if the top be cut off: but he does not say this as of his own experience, and the generality of writers upon gardening seem to recommend the contrary. *Art of Husbandry*, Vol. II. c. 3.



In the choice of stocks from the nursery, for grafting upon, the preference should always be given to those which have been raised from the seed, as before directed, and particularly to such as have been transplanted once or twice, and are the straightest, smoothest and healthiest. The next to these, in point of goodness, are those which have been raised from layers, or cuttings; but, as I have repeatedly said, no suckers from the roots of trees should ever be used for stocks, for the reasons already assigned.

The lower, that is to say the wilder, the stock is, and the higher the cion grafted on it is placed, the better will be the fruit, especially if the graft be from a sweet kind; and the more space the stock has had in the nursery, the sounder, and better ripened, and more compact its wood will be. Also, the oftener it has been transplanted, in a proper season, and with due care to trim its roots, the stronger and more numerous those roots will be, and consequently the head of the tree more flourishing afterwards.

For old trees, already growing in the places where they are to remain, and whose fruit it is intended to renew or change, there is no other choice than that of the branches, of which the young, healthy, well situated, and smooth barked are the best to graft on. If these trees stand against walls, or in espaliers, it will be proper to graft six, eight, or ten branches, according to the size of the tree; because they will then be much sooner furnished with new branches, than when a less number of cions are put in; but if they are standard trees, four or at most six cions will be sufficient.

As a general rule what trees will take and thrive upon each other (an essential circumstance concerning which no clear or sure directions have yet



been given by any of the writers on this subject, if we except Mr. Worlidge<sup>r</sup> and Mr. Miller<sup>s</sup>), it is to be observed, that all those which are of the same genus, that is to say, which agree in their flower and fruit, will grow upon each other: for instance, all the nut bearing trees may be safely grafted on each other; and so may all the plum bearing tribes, under which are comprised not only the several sorts of plums, but also the almond, peach, nectarine, apricot, &c. which agree exactly in their general characters, whereby they are distinguished from all other trees\*. But as many of these are apt to emit large quantities of gum from such parts of their wood as are deeply cut or wounded; so the tender trees of this kind, *viz.* peaches, nectarines, apricots, and cherries, which are most subject to this accident, are found to succeed best when they are budded or inoculated. Cherries are, perhaps, the most apt of all trees to bleed greatly when they are cut.

The most proper season for grafting is in the spring (*viz.* in February or March, as was before said,) just before the rising of the sap, or, at least, before it rises in any quantity: but the weather

<sup>r</sup> *Systema Agriculturæ*, c. 7. §. 4.

<sup>s</sup> *Gardener's Dict.* Art. GRAFTING.

\* By the same rule, as Mr. Miller observes, all such trees as bear cones will do well upon each other, though they may differ in one being ever-green, and the other shedding it's leaves in winter; as is seen in the cedar of Lebanon, and the Larch tree, which are found to succeed upon each other very well: but these must be grafted by approach, for they abound with a great quantity of resin, which is apt to evaporate from the graft, if separated from the tree before it is joined with the stock, whereby they are often destroyed; and so must also the laurel on the cherry, or the cherry on the laurel. All the mast-bearing trees will likewise take upon each other, and those which have a tender soft wood will do well if grafted in the common way; but those that are of a more firm contexture, and slow of growth, should be grafted by approach. *Gardener's Dict.* Art. GRAFTING.



must not be frosty, or wet, nor should very high or bleak winds reign when this work is done. Hereon, and upon the exact joining of the inner bark of the cion, with the inner bark of the stock, so that the sap which runs between the bark and the wood may be communicated from the one to the other, especially towards the bottom of the cion, depends chiefly the success of grafting.

Another circumstance particularly recommended by Mr. Worlidge and Mr. Mortimer, and well worth attending to on this occasion, especially in grounds that are not perfectly well sheltered, is, to graft the cions on the south-west side of the stock; because, as the most boisterous wind in summer comes from that quarter, it will, in this case, blow to the stock, and not from it; whereby the graft will be best enabled to bear it's force. For this reason also, and to prevent it's drawing too much, the graft should not be above four or five inches high above the stock. To prevent the entrance of wet into the cleft of the young grafted stock, all the cut part must be kept well covered with clay, or cement, till the bark is grown over it. If these precautions are strictly observed, the operation will seldom fail, supposing it to be rightly performed, and at a proper season, unless the weather should afterwards prove extremely bad. February is reckoned the most eligible time for grafting the early fruits, such as cherries, pears, and plums; and March the most proper for apples: but, unless the weather be tolerably mild and open, and quite dry, it is best to stay till there is a kind of certainty of the frosts being over, even though that should not be till the middle of April, in a backward spring.

For inoculating, the best time is when the sap is at the highest, that is to say, from about mid-  
 O 2 summer



summer, to the end of July ; because the rind is then most easily separated from the wood.

If any of the stocks that were budded in the summer fail, they may be budded again in the following spring ; and if this re-budding, which may be repeated as often as is thought proper, in the smoothest part of the stock, still continues to miss, they may be cut down below the budding, and then be grafted.

The implements necessary for grafting are, a fine small hand saw, to cut off the heads of large stocks ; a good strong knife with a thick back, to make clefts in the stocks ; a sharp pen knife, to cut the grafts ; a grafting chissel and a small mallet, to pare away the wood ; bass strings, or wollen yarn, to tie the grafts with ; and a quantity of clay, or cement, properly prepared, to lay over the incisions, in order to prevent their bleeding, and to keep out the air.

The method of preparing the clay intended for this purpose is, to mix thoroughly together a quantity of strong fat loam, some new stone-horse dung broken into small bits, a little tanner's hair, or straw or hay cut very small, with a little salt, and as much water as will make the whole of the consistence of pretty stiff mortar. The hair, or chopt straw or hay, makes the loam adhere the closer together, and the salt prevents it's cracking in dry weather. The more this mixture is worked and beaten together, which it should be at least every other day for a month before it is used, the better it will be : but care must be taken not to let it be exposed to frost, or drying winds, whilst it is preparing.

The cement, or composition, which some people have used of late years, and which they have found to answer the design of keeping out the air better than the clay before mentioned, is made of turpentine



pentine, bees wax, and rosin, melted together. This, when it is of a proper consistence, is laid about a quarter of an inch thick upon the cut part of the stock, around the graft; and has this farther advantage over the clay, that there is no danger of it's being hurt by frost, for cold hardens it, and when the heat of summer comes on, by which time it is no longer wanted on the tree, it will melt, and fall off of it's own accord \*.

The following ways of grafting are the principal, and most approved.

*CLEFT-GRAFTING*, called also *Stock*, or *Slit-grafting*. This is used chiefly for middle sized stocks, from one to two inches in diameter. The season for it is in the months of February, and March; and the method, as now practised, is thus.

The head of the stock being sawn, or cut off, with a slope, smooth and clean; a perpendicular cleft is made therein, about two inches deep, with a strong knife, or chissel, from the top of the slope, as near to the pith as may be without touching it. In this cleft, the grafting chissel, or a wedge, is put to keep it open. The graft, or cion, is prepared by cutting it aslope, in form of a wedge, to suit the cleft; only leaving a small shoulder on each side: and, when cut, it is to be placed

\* The wax ordinarily used for grafting, is a compost of one pound and an half of pitch, a quarter of a pound of bees wax, and an ounce of oil of almonds, melted and mixed together; with the addition, in spring or autumn, of a moderate quantity of turpentine. CHAMBERS, *Clyclopædia*.

The country gardeners who use only clay, lay over it a piece of linnen cloth, to keep it moist; and to prevent it's cracking with the heat of the sun, they tie moss over that. *Id. ibid.*

Mr. Mortimer recommends tempered clay, or soft wax, for cleft-grafting, whip-grafting, and grafting by approach; but clay and horse-dung for rind-grafting. *Art of Husbandry*, Vol. II. Book XIV. c. 2.



exactly in the cleft, so as that the inner bark of the cion may aptly, and closely, join to the inner part of the bark, or rind of the stock; in the dextrous performance of which, the chief part of the art of grafting consists. That side of the cion, which is to be placed outward, at the part where it is cut wedge-wise and inserted into the cleft of the stock, should be much thicker than the other side, the better to facilitate the exact joining of it's rind to that of the stock; for if these two do not unite, the graft will not succeed. The rind of the stock chosen for this way of grafting should therefore not be too thick; because it will then be the less manageable. If the cleft pinch too tight, a small wedge may be left in it to bear the stress. As soon as the graft is properly fixed, the cleft should be closely covered over with clay, or, which some think better, with moss, or the fresh bark of a tree bound on with ozier.

When this method, which is the most ancient<sup>t</sup>, and most common, manner of grafting, is used to stocks that are not strong, a ligature of bass should be made around the stock, to prevent the opening of it's slit; and the whole should then be clayed over, or covered with the cement before described, to hinder the air from penetrating into the slit, so as to destroy the graft, only two eyes of which should here be left above the clay, for shooting.

The straightest and smoothest part of the stock should always be preferred for grafting, in whatever way this operation is performed; and also for budding.

*Grafting in the Rind, or Shoulder-grafting*, likewise call'd *slicing and packing*, to distinguish it from *Grafting in the Bark*, which will next be spoken of, is performed in the following manner,

<sup>t</sup> See VIRGIL. *Georg. Lib. II. v. 78.*



about the latter end of March, or the beginning of April, on more slender stocks than those which are commonly used for cleft-grafting.

The top of the stock is cut off in a smooth, strait place: then the cion, or graft is prepared by cutting it on one side from the joint, or seam, down slope-wise, making the slope about an inch, or an inch and an half long; and observing it's bent, so that the cion may stand nearly upright when it is fixed to the stock. At the top of the slope, a shoulder is made, whereby it is to rest on the crown of the stock. The whole slope must be plain and smooth, that it may lie even to the side of the stock. The length of the cion used here may be about four inches from the shoulder, for a standard tree; but for a dwarf, or wall-tree, it may be six inches. When the cion is prepared, the outside of it's sloped end, from the shoulder downward, is applied to the west, or south-west side of the stock, and it's length and breadth measured thereon; which done, the bark of the stock (but not any of it's wood) is cut away to those dimensions, that the cut part of the cion may be fitted in as exactly as possible. In doing this, regard must be had to the bigness of the stock, and the thickness of it's bark, in order to proportion thereto the length and breadth of the cut part of the cion; otherwise the passages of the sap in the stock and cion will not meet, and the cion will then, of course, perish. When the cut part of the cion is exactly fitted to, and laid on that of the stock, they are bound together with woollen yarn, and covered with clay an inch above, and as far below, the head of the stock; working it round the cion, till it become sharp at top, that the rain may run down it.

This method has several advantages over the former. Among these are, that the wound heals up sooner, and that, in the mean time, it is in less



danger from the weather ; that it does less injury to the stocks and grafts, by avoiding all severe splittings and pinchings ; that the bark is more easily placed in the passage of the sap here ; than in the cleft ; that the graft thrives and shoots with greater vigour, and bears sooner, in this way than in that ; and that it is practicable on smaller stocks than the other, which must have a good body, and consistence, before they can bear cleaving.

*Grafting in the Bark* is performed thus. Prepare the stock and cion as for grafting in the rind, both as to time and manner ; but, instead of cutting out the bark of the stock, slit it down, on the south-west side, from the top, almost as long as the sloped part of the cion, and at the top of the slit loosen the bark, with the point of your knife. Then thrust an instrument, made of very hard wood, ivory, silver, or the like, and formed at the end like the slope-end of the cion, but much less, down, between the bark and wood, to make room for the cion ; which being put in, the bark is to be so managed, as that it may close exactly to the stock and edges of the cion, and the whole is then to be bound up, and covered as before.

*Whip-grafting, or Tongue-grafting*, is proper for small stocks, from an inch diameter to a quarter of an inch, or even less. Mr. Worlidge, Mr. London, Mr. Miller, and others, speak of it as the most effectual way of any, and that which is most in use, because the cion covers the stock much sooner in this method, than in any other : for here the scion and the stock must always be of the same thickness. There are three ways of performing it, and all of them may be practised somewhat later than either of the foregoing.

The first is, to slope the cion off a full inch, or more ; then to do the same to the stock ; and afterwards to tie the one to the other, with bass or yarn,



yarn, so as to join them closely at every part, but particularly at the rind; and then to cover the joint carefully with well tempered clay. The bass used for this, or for any other binding, should be taken from a sound mat, and be soaked in water for some hours, to increase it's strength, and render it the more pliable.

The second way is, to make a shoulder in the graft, and, the head of the stock being cut off and smoothed, to join it as in grafting in the rind.

The third method, which is an improvement of the last, is properly named *tipping* or *tonguing*. This is done, by cutting the stock off slanting, as before, and leaving at it's upper side a thin piece, or tongue, as it is called, of the wood, pared away like the lower end of a cion. The cion is then sloped, and tongued, in the same manner as the stock, and a slit is made in each of them, downward in the stock, and upward in the graft, on the side opposite to the tongue, so that each may receive the tongue of the other. The cion is then joined to the stock, as closely as can be, particularly at the bark; a ligature is made round them with bass or woollen yarn, and the engrafted part is well covered with clay or cement.

*Side-grafting*. In this, the cion is prepared as in whip-grafting; but the head of the stock is not cut off at the time of performing the operation. Instead of that, so much of the bark as the cion will cover is pared off from the west-side of the stock; then both the cion and the stock are slit in the last mentioned manner of whip-grafting, and they are bound together, and closed up with clay. At the year's end, the top of the stock is cut off at the grafted place, slope-wise; and the wound is covered with clay or cement.

*Scutcheon-grafting* is another method of grafting in the rind, by slitting the bark of the stock in form



form of the capital letter T, loosening it with the point of a knife, and inserting a cion prepared as above. This is practised in June, July, and August; especially if bark does not part easily from the stock; and in case of failure, it is properly supplied by cleft-grafting, in the ensuing month of February or March.

*Crown-grafting* is only practised in the larger trees, which are capable of receiving a number of grafts, and are too big to be cloven. For these, the head or main branches, being cut off horizontally, four or more grafts are placed round the stock, between the bark and the rind, somewhat in the manner of a crown. The most proper time for performing this is about the latter end of March, or the beginning of April. After the intended number of cions are inserted, which is done exactly in the same manner as that already delivered for grafting in the rind, the whole crown of the stock is well clayed over, and only two eyes of each cion are left uncovered; that being sufficient for their shooting.

This method of grafting was more practised formerly than it is at present; many people having been discouraged by the ill success that has frequently attended their cions, which have been blown out of the stock, by strong winds, after they had made large shoots, and even after they had grown there five or six years. But this accident may be prevented, by tying the cions to stakes fastened to the tree, till they are so firmly fixed, as to have almost covered the stock.

*Root-grafting* is a modern invention, the design of which is somewhat different from that of any of the former methods; this being for the propagation, or multiplication, of plants already fitted to produce their fruit.



To perform this, take a graft, or sprig, of a young tree, which you intend to propagate, and a small piece of the root of another tree of the same kind, or of a like genus, and whip-graft them together: observing, that the but-ends of the graft and root be well united, and that the rind of the root join closely to that of the graft. These may, afterwards, be planted out at pleasure, and the piece of root will collect the nutritive juices, and feed the graft, as the stock does the other way.

This method of propagation is very easy and expeditious; roots being more plentiful than stocks: by this means the pieces of roots of one crab-stock, for example, or of one apple-stock, will serve for twenty or thirty apple grafts; and the like of other trees. It is also an excellent way for raising of tender trees, which will hardly bear being grafted in the stock. Add, that trees thus grafted bear sooner, and are more easily dwarfed, than those done any other way.

The only objection against this method is, that the young tree grows but slowly at first, which is occasioned by the smallness of the root that feeds the graft; for in all trees the head must follow the increase of the roots, from whence it hath it's nourishment.

*Reiterated grafting, or grafting by a double, or triple incision*, is another method mentioned by Dr. Agricola, whose work, though chimerical enough in many respects, contains, notwithstanding, several good things. To perform this, first graft a good cion on a stock, and cut it away to one half, or a third part; then fix to that remaining part of the cion, another graft, of a better kind; and to that a third: for the oftener the tree is grafted, the finer fruit it produces; as was before instanced in what the gardeners about London call double worked peaches.

By



By this method, the author above-mentioned assures us, that he produced muscat pears, which were admirable ; making, at first, use of a stock grafted with a pound-pear, on which he grafted a summer bon-chretien ; and when the branch of this last had shot, he grafted on it a cion of a bergamot, which he also cut, and grafted on it a cion of a muscat pear.

*Grafting of Branches* is also commended by Agricola, as a very certain and profitable operation : best practised on large, full-grown, and even old trees.

To do this, half or more of the branches must be lopped off, and grafts of three or four years old be applied to them ; taking care to have stakes, or other things, to support them against the wind, &c.

He adds, that by this method, you will have, perhaps the same year, or at least the second or third, such a quantity of fruit, as the youngest and soundest tree would hardly produce.

*Grafting by approach*, called also *Inarching*, and *Ablatation*, is used only when the tree intended to be grafted, and that from which the graft is to be taken, stand so near, or can be brought so near to each other, that they may be joined together. The method of performing it is thus. The branch to be inarched is fitted to that part of the stock where it is to be joined ; the rind, and part of the wood, of one side of that branch, is then pared away, very smooth and even for the length of three inches ; and afterwards the other branch, which is to serve for the stock to which the graft is to be united, is served in the same manner, so that the two may join closely and equally together, that the sap vessels may meet. A little tongue is then cut upwards in the graft, and a slit is made in the stock, to receive it ; so that when they are joined,  
the



the tongue prevents their slipping, and the graft is the more closely united to the stock. When they are thus placed exactly together, they must be tied with bass, worsted, or some other soft thing; and the place of junction must be well covered over with grafting clay, to prevent the air from drying the wound, and the wet from rotting the stock. A stake must also be fixed in the ground, and both the stock and the graft must be tied thereto, to prevent their being displaced by the wind. When they have remained in this state four months, they will be sufficiently united, and the graft may then be cut off from the mother tree; observing to slope it close to the stock. It is of great service to the graft then to lay a fresh coat of clay all round the grafted, or joined part. This operation should be performed in April or May, that the graft may be perfectly united to the stock, before the ensuing winter. It is chiefly practised upon oranges, myrtles, jasmines, firs, pines, and some other trees, which do not succeed well in the common way of grafting or budding. But, though orange trees are here mentioned among the rest, this practice is not to be advised for them, or for any other trees, if they are intended to grow large; for that they hardly ever do in this method; and accordingly it is seldom used but for the curiosity of having a young plant with fruit upon it, in a year or two from its having been raised from the seed. This is, indeed, effected by inarching a bearing branch into a young stock; but the plant so treated seldom lives long.

The walnut, fig, and mulberry, will also take by this method of grafting, though neither of them will succeed in any other way: but still, as I have just observed, they, like all other trees that are thus managed, will remain weak, and stunted



stinted in their growth, besides the shortening of their otherwise usual time of duration.

All grafts, particularly of young cions, are subject to be injured by birds: but that may be prevented by binding some small bushes about the tops of the stocks.

The binding of the grafts, whether it be of bass or yarn, should be loosened at least, if it be not entirely taken off, at midsummer, or thereabouts; lest it's then too great tightness (as the stock will have increased in bulk, and the binding perhaps have been swelled, and consequently shrunk, by the weather,) should injure the plant.

*INOCULATING*, or *BUDDING*, is deemed preferable to any of the ways of grafting, for most sorts of fruit trees, but particularly for all stone-fruits, such as peaches, nectarines, apricots, cherries, and plums. It is also the most successful for oranges, lemons, and other tender or exotic plants. The reasons are, that the trees are less wounded, and consequently less apt to bleed, in this way, than when they are grafted; and that the buds, which are here inserted into the stock when it is fullest of sap, are much less liable to fail, than the grafts which are applied to it before the sap has well begun to rise, or at least before it has risen in any great quantity: for it frequently is to the want of a sufficiency of sap to feed the graft so early in the spring as is requisite, that the gardener has the mortification to see his expectation baulked when he uses that method.

The stocks for inoculating are raised in the same manner as those for grafting; and the age at which they are fit for either is the same.

The season for this work is, from the middle of June, to the middle of August, according to the forwardness of the season, and the nature and condition



dition of the trees intended to be used. This last may be easily known, by trying whether the buds will come well from off the wood: or, which is the most general rule, by observing when the buds are formed at the extremity of the same year's shoot; for that is a sign of their having finished their spring growth. The evening of a fair day, in a dry season, is the best time for inoculating; for if rain falls upon the buds before they have taken, most of them will be destroyed. The middle of a very hot day is by no means proper; because the shoots, or cuttings, from which the buds are to be taken, will then perspire so fast, as to leave the buds destitute of the necessary moisture; especially as they are generally cut from the trees some little time before they are used. That time should, for this reason, be as short as possible: but if there be a necessity of bringing them from a distance, the shoots should be wrapped in fresh and moist leaves and grass, to keep them cool; for by that means they may be preserved two or three days: and if they seem to be a little withered when they arrive, let their but ends be set for two or three hours in just as much water as they can imbibe, and they will soon recover, so that their buds may be taken off clean and easily. But it is very wrong to lay the whole of the shoot in water, as some do, to revive it, when it appears to be somewhat dried; because the buds then become so saturated with moisture, that they have no attractive power left to imbibe the sap of the stock, and thereby often miscarry.

The way which Mr. Miller advises<sup>u</sup>, to avoid this, when the cuttings are to be brought from a-far, is, to have a tin instrument, furnished with a socket about ten inches long, and a cover to the

<sup>u</sup> *Gardener's Dict.* ART. INOCULATING.



top, in which must be five or six holes: as much water should be put into this socket, as will fill it about two or three inches high, and the cuttings should be placed therein in an upright position, so that the part which was cut from the tree may stand in the water. The cover is then fastened down to keep out the air, and the holes in it are sufficient to let the perspiration of the shoots pass off, as it ought to do, because it would be very hurtful to them if it were pent in.

The buds which are to be inoculated should not be too young or tender, nor yet too old: of the two, young ones are the best. They must be taken from strong and well grown shoots of the same year, and from the strongest and biggest end of those shoots.

The manner of inoculating is thus. Being provided with a sharp penknife, having a flat haft, the use of which last part is to raise the bark of the stock to make room for the bud; with a quill cut half way through, and made sharp and smooth at the end, to divide the bud and rind from the stock; with woollen yarn, or rather slips of sound bafs mat soaked in water; and with proper cuttings of the tree intended to be propagated; choose a smooth part of the stock, about five or six inches above the surface of the ground if it is to be a dwarf, but at the height of five or six feet if it is to be a standard: then make an horizontal cut there across the rind of the stock, so as not to wound the wood underneath, and from the middle of that cut slit the rind downward, gently, about two inches, in the form of a T. Then, cutting off the leaf from the bud, and leaving the footstalk remaining, make a cross cut about half an inch below the eye, and a very little above it, and with your knife slit off the bud, with part of the wood to it, in form of an escutcheon: this  
done,



done, separate the bark and bud quickly, and dexterously, with your quill, or knife, from the slip of wood that was taken off with it, so as not to leave the root, or eye, of the bud behind; for if that is wanting, the bud will not grow. The bud must therefore be examined as soon as it is taken off; and if a hole is perceived under it, on the inside, it should be thrown away, as having lost it's root, and another must be prepared\*. When the bud is ready, raise the bark of the stock where the cross incision was made, with the flat haft of your knife, clear to the wood, and then insert therein the shield or bud, slipping it down smooth between the rind and the wood of the stock, till it's top join to the cross cut. Any part of the rind belonging to the bud may be cut off, if it be too long, or too broad, for the slit made in the stock. When the bud is thus exactly fitted to, and placed in, the stock, they must be bound closely round, beginning at the bottom of the slit, and proceeding upward to it's top, so as to miss only the eye of the bud; for that should not be covered.

Another way of inoculating, which Mr. Worlidge recommends\* as a speedier and more successful method, is to slit the rind of the stock upwards from the cross cut, and to slip the shield, or bud, upward therein; then to cut off the superfluous length, if any there be, of the rind of the bud,

\* Mr. Miller observes, that, though the common practice is to divest the bud of that part of the wood which was taken with it from the shoot; yet, in many sorts of tender trees, the best way is to preserve a little wood to the bud, the more effectually to prevent it's miscarrying: for that the not attending to this has made several people imagine, that some kinds of trees cannot be propagated by inoculation; whereas, if they had performed it in this method, they might have succeeded, as he hath frequently experienced.

\* *Systema Agriculturae*, c. 7. §. 7.



when this is in it's proper place, that is to say, when it's eye is at, or scarcely any thing beyond, the crossing of the incision; then to join the back of the bud to that of the stock, and to bind them as before. Or, which is yet more expeditious, and which answered well in his practice, to cut the edges of the bark about the bud square, to make a quite cross incision in the bark of the stock, to receive the bud so cut, and then to bind the whole, excepting the very eye of the bud, fast, as before directed. — It is to be observed the quicker the operation of inoculating is performed, the better it always succeeds.

Two or three buds may be inoculated on the same stock: of which some, out of curiosity, avail themselves, in order to have different sorts of fruit upon the same tree.

In about three weeks or a month after the inoculation, the bandage should be taken off; for if it is continued on too long, the stock will be pinched thereby; and the bud greatly injured, if not totally destroyed. At the same time it will be easy to see which of the buds have taken. Those that have joined to the stock will look fresh and plump; and such as have failed will be black and shrivelled.

In March following, the stock must be cut off about three inches above the bud, sloping it, that wet may not lodge upon it; and the next year it should be cut off close above the bud, that this last may cover it, as grafts usually do. In the mean time, it is very proper to fasten thereto the shoot which proceeds from the bud, to prevent all danger of it's being blown out.

It is an invariable rule, that no success is to be expected in inoculation, if the sap does not run well; that is, if the bark will not part readily from the wood of the stock.



## ARTICLE III.

*Of Transplanting of Fruit Trees.*

**T**HE stocks which have been grafted, or budded, as directed in the foregoing article, will be fit to transplant into the places where they are to remain, in the spring, or autumn, of the ensuing year. October and November, or as soon as the trees have begun to shed their leaves, are generally reckoned the most proper time for removing them, if they are to be set in a middling, or dry, soil: but if they are to be planted in moist, or wettish ground, it is thought most advisable to wait till the next February, or beginning of March, that their roots may not be exposed to the danger of being soaked in water during the winter. At all events, they should not exceed two years growth from the graft, when they are transplanted, if it be desired that they should flourish with vigour: for the younger and smaller a tree is when it is removed, the more likely it will be to thrive and prosper; because it suffers less injury by the removal, than an older or larger tree. Thus an orchard, for example, of young trees, will soon overtake another planted with larger trees set at the same time; and the young ones will prove by much the most durable.

These are the directions generally given, and almost universally observed, in regard to the season for removing of fruit trees: but experience has shewn, that they may be transplanted with great safety earlier in the autumn than is commonly practised. If this is done when they are sent from a warmer country to a colder, they will have time to take such root before the winter comes on,



that there will be less hazard of their being injured by frost then, than there would be of their being hurt by drought in the spring.

Fruit trees have been transplanted, to a contiguous spot, even when in full sap, and with their fruit upon them, without any other precaution than lessening their number of branches, and trimming their roots as usual when they are taken up; and they have succeeded so much beyond expectation, that I cannot but recommend the making of farther trials of this practice. Even the fruit upon the trees did not drop off, in one instance, in particular, of which I have been very credibly informed.

In digging up the young stocks, previously prepared for bearing fruit, by grafting or inoculating, as before explained, care must be taken not to tear or bruise their roots. If they are to be sent to a distance before they are replanted, the earth should be removed from about their roots, and then all their small roots and little fibres should be cut off, as close as can be to the parts from whence they proceed, lest the air should corrupt them (which is known by their turning black), and they should grow mouldy, decay, and rot, so as to injure the new fibres after they have been set again; or even so as to distemper, or perhaps kill the tree. For the same reason all bruised or broken roots should also be pruned off smooth. All irregular roots which cross one another, and all down right roots, must likewise be cut away: in short, the roots of a tree which is to be sent far, and consequently to remain a considerable time out of the ground, should be so pruned as, in some measure, to resemble the fingers of a hand stretched open. The larger roots, which are left, should be shortened in proportion to the age, strength, and nature of the tree. The tender rooted kinds, for example, such



such as the walnut and the mulberry, should not be pruned so close as the more hardy sorts : and though eight or nine inches may be a sufficient length for the largest roots that are left to apple, pear, cherry, plum, peach, nectarine, and apricot-stocks of only one year's growth from their grafting or budding ; much more is necessary for older trees. In either case the roots should extend wider than the head of the tree ; and the more ways they spread, the better it will be. The tops of the branches of apple and pear stocks may be shortened a little ; but those of stone fruit should not, as yet, be cut at all : neither should any graft be pruned the first year, though it shoot never so strong.

If the stocks thus trimmed, and carefully divested of their remaining leaves, are covered over with moss, especially about their roots, and with straw and mats over that, to prevent their being too much dried by the air, or galled in the carriage, they will bear to be kept out of the ground two or three months, provided it be not at their time of vegetating. This is manifest by the orange and other trees which are brought to us from Italy, and which seldom fail, if they are properly managed, though they have been kept three or four months out of the ground. Care should also be had to the proper season, when stocks are to be sent to a distant place, or to a climate much different from that in which they were raised. For example, as Mr. Miller very rightly advises, if they are to go from a hot country to a cold one, or from a warmer to a colder place, they should be sent at such time of the spring of the year, that, as they come toward the colder parts, the season may be warmer, and there may be time



to recover them before the ensuing winter, in case of their having received any hurt by the way: for those which arrive in the autumn often perish in the winter, through want of their being able to get root before the cold comes on. By the same rule, those which are to go from a cold country to a hot one, should always be sent in the beginning of winter, or rather sooner, if the distance be great, that the cold may prevent their shooting before they arrive, and that they may have sufficient time to take root before the heats come on. — If the roots appear to have been too much dried when they arrive, it will be right to set them in water for about eight or ten hours, before they are planted: but only the roots should be immersed therein.

When the stocks are to be replanted immediately, they should be taken up with as much earth about them as can be, and it will be necessary then only to trim their fibres, to cut off their perpendicular roots, if any such are observed, and to shorten the ends of their horizontal ones, because these extremities, which are generally very weak, commonly decay after their being moved, and might therefore be apt to communicate a rottenness to the rest, if they were left on. The pruning of their heads depends on the manner of growth for which they are intended. If they are to be standards, the stems should be cleared of all side twigs, and buds, quite up to it's top: but if they are to be planted against Walls, or in Espaliers, they should be set with the greatest part of their heads on, and these should remain untouched till the spring, when it will be proper to cut their shoots down to five or six eyes, just before they begin to open their buds. Only such irregular shoots as cross each other, so as to endanger their being galled and wounded by any strong



strong friction occasioned by high winds, and the broken or wounded parts, if any have been so injured in the taking of them up, should be pruned off at the time of transplanting : but none of the main leading shoots should be meddled with then, by any means ; they being necessary to attract the sap from the roots, and thereby promote the growth of the tree.

Each of these methods of planting fruit trees has it's advantages, and is attended with some disadvantages ; concerning both of which the following reflections are submitted to the judicious reader.

Standards, growing in open ground, can extend their roots every way, and by that means are more plentifully supplied with nourishment, than wall trees can be : but as they generally rise high, it is supposed, that the sun has not so great a power to exalt the juices and flavour of the fruit, as when the trees are kept nearer to the earth. To obtain this advantage, means are therefore used to prevent their running up in height, by making them dwarfs, and planting them in espaliers, or against walls.

Whoever attends to the whole process of managing dwarfs, must see, that, if I may be allowed the expression, from their cradle to their grave, means are used to prevent their arriving at that flourishing state which nature intends in all her works. As the perfect condition of the offspring depends chiefly on the health and vigour of the parent ; so, from trees thus crippled, we must expect either a scanty, or an impaired fruit. This method is therefore fit only for those who are, perhaps, more curious than wise ; and to them I leave it.

Espaliers answer two purposes : the first is, that of making an useful and ornamental boundry to



the quarters of a kitchen garden; and the second, the now fashionable end of preventing the trees from running up in height. I shall here consider chiefly the last intention.

It is justly supposed, that the reflection of the rays of the sun makes the heat much greater near the surface of the earth, than at some distance from it; and it is alleged, that the fruit upon espaliers must, for this reason, be higher flavoured than that which grows on loftier trees, and is, of course in a cooler air. It is likewise said, that as espaliers are hindered from extending themselves, a greater quantity of sap is brought to their remaining branches, than would be if they were suffered to run their full length. — But this may admit of some doubt; because, as it is well known that all plants which extend themselves freely above the earth, extend their roots with equal vigour underneath it; so it is, from thence, at least problematical, whether by confining the extent of the branches, the roots are not also equally confined. I have already had occasion to speak pretty fully on this subject, in treating of grain and other vegetables, in former parts of this work, to which the reader is therefore referred.

An undoubted advantage which espaliers have over walls is, that these last, being built close and compact, repel the winds, and by that means damage the tender plants that lie within the reach of the repulsion: whereas the former deaden the violence of the winds, which by not dwelling so long upon them as they do against walls, are consequently less liable to injure the trees, their blossoms, or their fruit: besides which, they afford, for the same reason, a much greater safeguard to the plants which they encompass in the quarters of the garden.

Where a boundary is wanted in a garden, it is certainly more advisable to plant fruit bearing trees



trees for that purpose, than barren or forest trees: but yet, as their growth is stunted even in this case, I doubt much whether the fruit is so perfect, as when the trees can arrive nearer to their full extent. The quantity of it must undoubtedly, at the best, be less.

An indispensable precaution necessary to be observed is, that no tree which make strong shoots, and delights to grow large, should be planted in an espalier. All such will constantly run out in large barren shoots, which will rob the few fruit bearing branches, and consequently the fruit on them of their due nourishment. Neither should trees which do not easily bear the knife be planted in espaliers; because the many wounds which they must receive in this method of training them, choak up their juices by the quantity of gum discharged at those wounds.

It is a general, and I believe I may say an hitherto almost unvaried, practice to plant all the finer fruits against walls, without sufficiently inquiring into the motives for so doing. To this I must observe, in the first place, that the borders under the walls are seldom made so wide as they ought to be, considering that the trees which are planted there can extend their roots but one way: and secondly, that due care is not taken to adapt the quality of the soil there to the nature of the trees; a precaution which ought to be attended to by those who are curious in their fruit, and which would cost only the trifling expence of bringing in a sufficient depth of proper earth.

The chief reason assigned for planting trees against walls is, the additional heat procured by the reflected rays of the sun, and the warmth communicated to the wall itself by the sun. This, say the advocates for this practice, hastens the ripening of the fruit, and exalts it's flavour; besides



sides that the shelter of the walls protects trees, natives of warmer climates, from our severe north and north-east winds.

To this I answer, that it is a constant observation, that all plants brought from a warmer climate to a colder, endeavour to bloom at their usual season, unless they are prevented by cold. The consequence of this is, that if the early part of the spring happens to be warm, the blossoms of such trees swell, and expand themselves : but as we cannot be exempted from frost so soon in the season, these blossoms are nipped in the bud; that is, the first frosty night stops the circulation in them, and they then necessarily die. Nothing shews more incontestably the stoppages of the circulation in trees, than tapping, for instance, a birch tree, early in the spring : for the warmth, or coldness, of the air at that time may be determined by the greater or less velocity with which the juice flows, or by the greater or less quantity of it, that is discharged, almost as certainly as by a thermometer. In frost, the discharge ceases entirely. It therefore is not at all wonderful, that the circulation is interrupted, by the same cause, in the finer vessels of flowers, and that the death of the flower is the necessary consequence. A very sharp frost, even after the early fruits are set, has the same effect on their yet tender vessels; and the owner is surprised to find his fruit fall off, in a few days after, without any seeming cause; unless recourse be had to I-know not what pestilential quality in the east wind, when the same effect would follow, did the frost come from any other quarter. Hence it is evident, that fruit trees would be benefited, rather than hurt, by preventing their too early blossoming.

Some gentlemen endeavour to guard against this accident, by sheltering their trees with skreens, which have a double effect; that of preserving them



them from the warmth of the sun by day, and that of defending them from the frost by night\*. But if these trees were planted as standards, where the air might play freely round them, the motion of the sap would be less forward, and the blossoms would consequently be less exposed to the injuries which happen from their coming out too early. They would likewise escape another great inconvenience which attends their standing against walls; namely, the two great inequality of the heat, as increased by the wall, and the coldness of the night, against which the wall affords no shelter, otherwise than as it screens the trees from the wind.

Another advantage of standards, and that no small one, is, that their fruit is more likely to escape the ravage of those numberless insects which harbour and breed in every crevice of a wall, and, imperceptible to our slight search, adhere to the branches nailed to the wall. I must add to this, that the many, and some of them large, wounds which are made in trees, in order to make them spread in a certain stated form, render them, and especially such as are apt to gum, much shorter lived than they would naturally be; which is a very manifest disadvantage, because the older trees are, while they continue sound, the better and higher flavoured is their fruit. Indeed some trees do not bear either in plenty or in perfection, till they have attained their full growth; by which time they are often destroyed by the sometimes

\* Mr. Bradley speaks of a nursery-man, at Brentford, who, having most sorts of fruits in espaliers, had portable hedges made of reeds in frames, which he set both at the back and front of his espaliers, as he saw occasion; and the same method has been tried to secure the fruit upon wall trees from blighting or too cutting winds: but, Mr. Miller says, never with much, if any, success.



necessary, but more frequently injudicious, use of the knife. Now a standard escapes that danger.

A farther reason which renders walls the less necessary is, that the fruits planted against them ripen before the sun has acquired it's full force in this climate. This is what happens to all our apricots, to most of our nectarines, and to the finest of our peaches: for it is well known, that the month of July is our hottest season, and that the heat of that month will therefore the most perfectly exalt the juices and flavour of fruit.

An apricot tree transplanted some years ago, even into a field, bore fruit, in the very unfavourable summer of the last year, 1763, much higher flavoured than it had ever done against a wall, or indeed than any tree against the wall had ever borne, in the garden from whence it was transplanted; though the field was exactly the same soil as the garden. The same thing happened likewise to a green gage.

Walls may be necessary for the later peaches: though even a Catherine peach will ripen on a standard, in a favourable situation.

But to return to the replanting of fruit trees immediately after their being taken from the nursery, and the farther management of them in the places where they are to remain.

The directions of professed gardeners, which gentlemen who are very curious in their fruit may follow with advantage, and but little extraordinary expence, are, that peaches, nectarines, apricots, and cherries, should be planted in a fresh hazel loam, taken from the surface of a pasture ground, to the depth of about ten inches, with the turf, and prepared by a year's exposure to the air, and frequent turning of it during that time, to render it mellow. A middling soil, neither too wet and heavy, nor over dry, is recommended for plums;



plums; and a gentle hazel loam, easy to work, and not apt to retain wet, for apples. Pears will thrive in almost any soil; even in moist, hungry, stony, and gravelly land, where apple trees will hardly live. However, to render things more simple, and easy of execution, which is a principal design of this work, I must observe, that a good fresh loamy earth, which is neither too light and dry, nor over strong and moist, though rather inclining to be strong than otherwise, is the best general soil, and will do well for almost any sort of fruit.

If the depth of the soil in which the trees are to be planted is not naturally sufficient (for it should be about two feet and an half deep for fruit trees in general); it is better to lay on fresh earth, so as to raise the border above the level of the rest of the ground, than to dig out the gravel, chalk, or whatever other hard substance may lie underneath, and then replace it with other earth; and far better than digging holes, as some do, down into the hard soil, and filling them with earth to set the trees in; without considering that their roots must soon become confined there, as in a tub, and that the trees will consequently neither flourish well, nor live long.

When these borders are made by adding to them earth brought from another place, they should be raised at least four or five inches above their intended future level, and that earth should be laid on a month or two before the trees are planted, that it may have time to settle thoroughly, and thereby be the less liable to sink afterwards. It is better to give them great breadth (never less than six or eight feet, especially under a wall) than depth, of earth; because this last is apt to entice the roots of the trees downwards, so as to endanger their future barrenness, by their being  
out



out of the reach of the influences of the sun, rain, and air: for when this happens, they imbibe a great quantity of crude juices, which only add to the luxuriant growth of the trees, and destroy their fruitfulness: nor are any fruits produced from such trees ever so well tasted as those which grow upon trees whose roots lie near the surface of the ground, and enjoy the kindly benefit of the sun's heat, to digest and correct whatever crudities there may be in the earth.

Another method which may be practised, for standards, (because they require a wider and more open space than either wall-trees or espaliers,) by those who have not the conveniency of bringing on an additional earth where the ground is shallow, or lies near gravel, clay, stone, chalk, or water, is, to take the top of one half of the same land, and lay it upon the other, in sufficiently wide ridges, abating the intervals like walks, and then to plant the trees in the middle of the ridges. By this means they will have double the quantity of earth to root in, and the walks, or intervals, will preserve the ridges from too great moisture. This, upon the authority of Mr. Worlidge<sup>z</sup>, is an experienced and approved remedy in dry shallow land, as well as in low wet ground.

It is a general rule, that the stiffer and moister the soil is, the shallower all sorts of trees should be planted therein.

Mild open weather, when the earth is moist, the air calm and serene, and the wind westerly, is the best for planting. Frosty, rainy, or misty weather should be avoided for this work, because it moulds and infects the roots of the plants. A hole being made with a spade, the tree should be set therein about the same depth as it was in the nursery,

<sup>z</sup> *Systema Agriculturae*, c. 7. §. II.



with it's roots extended in nearly the same manner as they were before; the earth should then be broken fine with a spade, or by hand, and scattered into the hole, so as to fall between every root, without leaving any large chasms between them: but it should not be screened, or sifted, lest it should settle too close and become too compact. When the hole is thus filled up, the earth should be pressed down gently about the stem of the tree; but it should not be trodden down too hard, especially in a strong or wet soil, because that would close the ground so as to obstruct the passage of the tender fibres of the roots, and the tree would be thereby retarded, at least, in it's growth, for perhaps a considerable time. The trees thus planted, either for standards or for espaliers, should be fastened to stakes driven down by the sides of them, to prevent their being blown down or displaced by the wind: for as to wall-trees, they may at this time, be slightly nailed to the wall, so as just to keep them in their places.

Mr. Worlidge<sup>a</sup>, Mr. Mortimer<sup>b</sup>, and most other writers on this subject advise, as a material circumstance, the replanting of the tree to the same aspect as it had before; that is to say, to place, for example, to the south, the same side of the tree as faced that quarter when it grew in the nursery: but Mr. Miller declares<sup>c</sup> that, after many trials, he could not observe the least difference in the growth of those trees which were so placed, and that of others which were reversed; and that he therefore does not hold it to be of any moment to observe this method.

<sup>a</sup> *Systema Agriculturæ*, c. 7. §. 9.

<sup>b</sup> *Art of Husbandry*, Vol. II. c. 2.

<sup>c</sup> *Gardener's Dict.* Art. PLANTING.



Great moderation should be used in the watering of all new planted trees; experience having shewn, that too much wet rots off the fibres of their roots almost as soon as they are produced, and that the tree is of course stopped in it's growth, if not totally killed, as has happened to several plantations which have been over-watered. — The reverend Dr. Hales placed the roots of a dwarf pear tree in water, and the quantity of moisture imbibed decreased daily, because the sap vessels of the roots (like those of some boughs which he cut off for the same experiment) were so saturated and clogged with moisture, by standing in water, that more of it could not be drawn up. Yet this experiment was tried upon a tree full of leaves, and thereby more capable to discharge a large quantity of moisture than such trees as are entirely destitute of leaves. It therefore is, as Mr. Miller rightly infers<sup>d</sup>, impossible that such trees can thrive, where the moisture is too great about their roots.

If the winter should prove severe, it will be proper to cover the surface of the ground, over the roots of the new planted trees, with rotten dung, tanner's bark, or some other similar substance, which the gardeners call *mulch*, to prevent the frost from penetrating so as to hurt their young fibres: but this should not be laid on too soon, because it would hinder the soaking in of the necessary moisture; nor should it, for the same reason, be left on too long in the spring.

The distances at which these trees should be planted, must be proportioned to their several kinds, and to the several purposes for which they are intended, as will be directed in the ensuing Articles.

<sup>d</sup> *Gardener's Dict.* Art. PLANTING.



## ARTICLE IV.

*Of the management of Fruit Trees planted against Walls.*

HAVING already given sufficient general directions for the building of walls for fruit trees<sup>f</sup>, as well as for preparing the borders under them<sup>g</sup>; and having also offered some reasons<sup>h</sup> why I cannot think them of such service to the ripening of fruit as they are commonly supposed to be, or agree with Mr. Miller when he says<sup>i</sup>, that “they are absolutely necessary in gardens “for the ripening of all such fruits as are too “delicate to be perfected in this country without such assistance,” because they certainly often counter-act here the very end for which they are intended; little remains but to speak of the method of managing such trees as are planted against them.

All the stone fruits are accounted peculiarly proper for walls, and so are many kinds of Pears. Some of the finer sorts of these last may indeed do well enough when so planted: but I cannot by any means think the Cherry, for example, a proper tree for a wall, because it will not bear the cutting necessary to train it in that manner. The late Pears and Peaches are, in my opinion, the only fruits really fit for this sort of culture. However, for the sake of those who choose to continue to extend it to other kinds, I shall observe, that Peach trees, and those of Nectarines,

<sup>f</sup> Page 15—17.

<sup>g</sup> Page 19, and 236, 237.

<sup>h</sup> Page 20, and 231—236.

<sup>i</sup> Gardener's Dict. Art. WALLS.



placed against walls, should be set about twelve feet asunder: Apricots should be allowed a breadth of sixteen or eighteen feet; Cherries and Plums, twenty-five feet; and most sorts of vigorous shooting Pears, from thirty to forty, according to the goodness of the soil, and the height of the wall.

The root of the tree taken from the nursery should be placed in a hole dug about five inches from the wall, and it's head should be inclined thereto, with the bud turned outwards, to conceal the wounded part of the stock. The hole should then be filled up, so as neither to leave chasms between the roots, nor to press the earth down too hard upon them. Some of the twigs of the young tree should then be fastened to the wall, to prevent the wind's displacing it so as to break the tender fibres of it's roots; the surface of the ground should be covered with mulch, to keep out the frost; and in the following spring, about the beginning or middle of March, according as the season is earlier or later, the head of the tree should be cut down to four or five eyes above the bud, just before it begins to shoot. In this cutting off the head, the gardener, to avoid as much as possible giving any disturbance to the roots, should set his foot down close to the stem of the tree, and take fast hold of the stock, below the bud, with one hand, to keep it steady, whilst, with the other, he slopes off the upper part gently, with a sharp knife, at the intended place, which should always be just above an eye. This should be done in dry weather; for if much rain should fall soon after, and wet get into the wounded part, the tree will be liable to suffer considerable damage: and for the same reason, together with it's preventing the closing of the wound, frosty weather should also be cautiously avoided. After the tree has



has been headed, the earth of the borders should be loosened gently, to render it more fit to admit the fibres of the roots; and if the mulch which was laid on in the autumn be rotten, it may be dug into the border, at some distance from the roots, with all possible care not to disturb or break them. When the dry weather comes on, a few sods pared off from a pasture ground, and laid upon the surface of the border, about the roots of the trees, with the grass downward, will preserve a gentle moisture in the earth, and be less apt to harbour insects, than any sort of dung or litter.

The above is the usual method of transplanting trees from the nursery to a wall. But Mr. Miller is convinced<sup>k</sup>, from experience, that, instead of taking from the nursery stocks (especially of peaches and nectarines) which have then made one year's shoots from the bud, it is better to single out such as were budded the preceeding summer, and have not made any shoot; provided the bud be found and plump, and the bark of the stock well closed at the place of budding; because, when this shall have put forth a shoot five or six inches long, in the following spring after being transplanted, as it will seldom fail to do, that shoot may be stopped by pinching off it's top, and thereby be made to produce lateral shoots, which may be trained to the wall, without having any head to cut off, as must be done to those trees which have had one year's growth in the nursery. The benefit of avoiding this operation is particularly great to such trees as are apt to bleed much, and singularly so to the most tender sorts. The stock of the tree transplanted in bud, before it has made any shoots, must indeed be cut down, likewise in the spring, to just above the

<sup>k</sup> *Gardener's Dict.* Art. PERSICA.



bud, because this will rarely shoot unless that be done; and the nearer it is cut to the bud, the sooner will the head of the stock be covered by the bud: for there is no occasion to leave on trees which are planted against a wall, a part of the stock, above the bud, to fasten the shoots to, as must be done with those in the nursery; because the shoots may here be immediately and properly secured, by fastening them to the wall: nor is this cutting off the superfluous part of the stock attended with any danger to the bud, if the wound be but covered with a little grafting wax, or clay, to keep out the wet.

No time is lost, but some may be gained, by this practice; as the trees which have shot before their being transplanted must be cut down, and there is a hazard of their shooting again.

In watering of these new planted trees, which should not be done unless the spring prove very dry, nor then often, or in great quantity, the pot should have it's nozzle on, so as to let the water out very gently, almost in drops only, as it were; for when it is poured down hastily, it hardens the ground: and if the head of the tree is watered at the same time as it's roots, and likewise gently, that refreshing will be of great service to it.

About the middle of May, the shoots of these trees, of which there will then often be several six or eight inches long, should be nailed horizontally to the wall. All fore-right shoots, and such as are weak, should also then be rubbed off, to strengthen those that are left. But if no more than two shoots have been produced, and those very strong, the tops of these should be nipped off at that time, and this will make each of them put out two or more shoots, whereby the wall will be the better furnished with branches. It will also be right to continue to refresh them gently  
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with water, from time to time, during the whole summer, if that season should be very dry, lest their roots, having but little hold of the ground the first year after transplanting, should be injured by the drought, so as to retard the growth of the tree.

In the beginning of October when the trees have done shooting, it will be time to begin to prune them. In doing this, the branches must be shortened in proportion to the strength of the tree; that is, if it be strong, they may be left eight inches long; but if weak, they should be shortened to four or five. The shoots thus cut should then be trained horizontally to the wall, so as to leave the middle of the tree void of branches, for that part will be easily furnished with wood afterwards; whereas, if the shoots are trained perpendicularly to the wall, the strongest will draw away the greatest share of the sap from the roots, run upwards, and leave the side branches so destitute of nourishment, as frequently to occasion their decaying and dying.

In the next summer, when the trees begin to shoot, they should be carefully looked over again; all fore-right or ill placed buds or shoots should be rubbed off, and such as are to remain, for future branches, should be trained up horizontally to the wall, in due order, as they are produced; for this is the principal season in which all fruit trees are best and most effectually modelled to their intended form. Every gentleman who wishes his trees to prosper to the utmost, and to grow with as much beauty as they are susceptible of, should therefore personally look over them at this time, and, with his own hand, rub off their superfluous buds and shoots: for if this elegant and essentially useful part of gardening is left to the hired gardener, it will often be neglected, or slovenly performed. Whosoever omits it, deserves



not to have good fruit. — This important business should not be deferred till midsummer, as is the common practice, because numbers of useless shoots, which must afterwards be cut off, will by that time have robbed the other parts of their due nourishment: and besides, it is by stopping some of the stronger shoots (by nipping off their tops) in May, that they are made to put out side shoots, which, being guided to the vacant parts of the wall, furnish every part thereof regularly with proper wood. Care must, however, be taken not to multiply these branches too much, for fear of weakening the tree so as to disable it for producing good fruit; and therefore no shoots should be stopped in the summer, unless there be an absolute necessity for new branches in any particular place. Neither should the branches be laid in too close together against the wall, because the great numbers of their leaves then exclude the air from their shoots, so that these are never duly ripened, and the fruit which is afterwards produced on them cannot, consequently, be so well tasted as that of trees whose shoots receive all the advantages of the sun, and air, to bring them to maturity.

In the third year, the branches till then trained horizontally will have acquired such strength, that there will not be much danger in permitting some of their shoots to go in a more perpendicular direction, in order gradually to give the whole tree the form of fan, which is by much the most beautiful, as well as the best way here, because the wall is thereby most equally filled with wood.

It is in continuing strictly to observe the two foregoing rules, *viz.* to furnish every part of the tree as equally as possible with bearing wood, and not to lay the branches in too close together, that  
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the art of pruning fruit trees in general, and particularly wall trees, chiefly consists. The former of these will always be completely effected by pinching off the tops of the young shoots, wherever an increase of wood is wanted, in May, as above directed. But as some have advised the doing of this in June, and others even later, I must remark here, that if we reflect that young shoots made so late in the year have not time to acquire a sufficient strength and solidity of fibres to resist the winter's frost, May will certainly be found to be a much more proper season: for whoever casts an attentive eye over fruit trees after a hard winter, will find many of their shoots killed by the preceding frost; and if he looks still more closely, he will see, that most, if not all, of these have been injudiciously forced out in a too late season\*. It is almost needless to say that April, which others again recommend for this work, is too early; because the wounded branch would then be in danger of being destroyed by a frosty night. — If these directions are judiciously followed, it will not be necessary to touch any fruit tree with a knife in the summer: and that the avoiding of this will be of infinite service to every species of them, is manifest from the many accidents to which they are liable when cut too much at that season. All the soft, tender, and pithy wooded sorts, such especially as the peach tree, require a considerable time to heal their wounds, when these are great, and in the meanwhile wet and rain easily soak into the wounded

\* All shoots which are produced after the middle of June will be crude and pithy; and though they may sometimes produce a few blossoms, yet these rarely bring fruit; nor are the future branches produced from such wood ever ripened, or compact, enough to secrete, filter, or prepare, the juices in so perfect a manner as is requisite for good fruit.



parts, so as frequently to make the branches canker and die.

As to the distance at which the branches of fruit trees, or rather the shoots of those branches, should be trained against a wall; nature gives us a sure guide, if we but attend to the size of the fruit and of the leaves: for it should be such that neither of these upon an upper branch may touch the branch underneath.

The winter pruning, as it is called, of fruit trees, is commonly performed in February or March: but the best season for it is in October, when their leaves begin to fall; for that will be early enough for their wounds to heal before the frost comes on, so that there will be no danger of their being hurt thereby. Thus all the ascending sap in the spring will be employed to nourish only those useful parts of the branches which are left; whereas, if they are not pruned till February, the greatest part of the sap then in motion in the branches, as may be observed by the swelling of the buds, will be drawn up to the extreme parts of the branches, to nourish blossoms which must afterwards be cut off: for the extreme buds of strong shoots always swell sooner than most of the lower ones, and constantly draw from those below.

It is the constant practice of gardeners, founded upon long experience, to prune weak trees early in the winter, that they may be the less endangered by the cutting, and luxuriant trees late in the spring, in order to check their luxuriance.

— Mr. Miller accounts for these effects in so learned a manner, as I must confess is past, I will not say *all*, but, *my* understanding. I therefore rest satisfied with the fact, and refer the curious reader to the article *PERSICA* in his Gardener's Dictionary.

Thus



Thus much for the time of pruning fruit trees in general. The manner of performing it is founded on the following principles.

*Peach* and *Nectarine* trees generally produce their fruit either upon the young wood of the preceeding year, or, at most, upon shoots of two years old, and these cease to bear after that age. The branches of these trees must therefore be shortened, according to their strength, in the manner before directed, in order to make them put out annually new shoots for the succeeding year. When the knife is used for pruning them, care should always be taken to cut them a little sloping behind a wood bud, which may be easily distinguished from the blossom buds; these last being shorter, rounder, and more turgid than the former; for if the shoot have not a leading bud where it is cut, it is very apt to die down to the next leading bud. This leading bud, or wood bud, is always necessary, to preserve a circulation of the juices in the branch. The length at which the pruned shoots are left, should be proportioned to the strength of the tree: thus, in a healthy strong tree it may be ten inches, or more; but in a weak one, it should not exceed six inches: however, this must also be determined, in some measure, by the position of a fine wood bud; for it is better to leave a shoot three or four inches longer, or to cut it two or three inches shorter, than one might otherwise choose to do, for the sake of such a bud; it being absolutely necessary for the future welfare of the tree. It is also necessary to cut out entirely, all weak shoots, though there may be many blossoms upon them; for these have not strength enough to nourish the fruit, but will weaken the other parts of the tree. It is to the neglecting of this, and to the not displacing of all luxuriant shoots as soon as they are produced, that half the blights we  
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hear complained of are, (though wrongly termed, and mistaken as to the cause,) in Mr. Miller's opinion, owing.

In nailing the shoots to the wall, care must be taken to place them, as nearly as possible, at equal distances, in order that their leaves, when come out, may have room to grow, without shading the branches too much. So far as the nature of the tree will permit, they should never be nailed upright, because they are very apt to shoot from the uppermost eyes, and the lower parts of the shoots become thereby naked, when they are trained in that manner.

When the fruit is set, and grown to the bigness of a small nut, it should be looked over, and thinned so as to be left at least five or six inches asunder; for no tree can afford sufficient nourishment to perfect so great a crop as it sometimes produces; and it is evidently better to pull off early such fruits as over-burden it, and therefore are not to remain on the tree, than to let them impoverish the rest by standing longer; especially as, in this last case, the tree itself is frequently so weakened thereby, as to be disabled from bearing well for three or four years after.

If the season should prove hot and dry, it will be proper to draw the earth round the stem of each tree, so as to form a basin of about six feet diameter, to cover the surface of the ground in the basin with mulch, and once in a week or fortnight, according to the heat and drought of the season, to pour down eight or ten gallons of water to the root of the tree: or where there is an engine, which will disperse the water in easy gentle drops like rain, if the same, or a larger, quantity of water is sprinkled all over the branches of the trees, this soaking down to the roots, will keep the fruit constantly growing, and prevent it's falling off.



off the trees, as it is very apt to do where this method is not practised. The fruit thus constantly nourished will also be much improved in it's taste, and the trees thus treated will be maintained in vigour. But this watering should not be continued longer than while the fruit is growing; because it will afterwards be hurtful to the trees and fruit; for a dry autumn ripens both wood and fruit better than a moist latter season.

Mr. Miller, who recommends this practice from his own long and extensive experience, blames, upon the authority of the same unerring guides, the too frequent custom of pulling off the leaves of the trees, in order to admit the sun to the fruit; because, as the leaves are absolutely necessary to cherish the blossom buds, which are always formed at their foot stalks, these buds must be greatly injured by pulling off the leaves before they have performed the office assigned them by nature.

After disproving the common opinion, that peach trees are not long lived, and that they should therefore be renewed every twenty years, by declaring that he has eaten some of the finest peaches of various kinds, which grew on trees upwards of fifty years old, and then ascribing this mistaken notion to the wrong practice of the French, who generally bud their peaches upon almond stocks, which are of short duration; he recommends dunging the borders where fruit trees grow, every other year, with well rotted dung dug into the ground in November, that the rain may wash down it's fertilizing particles before the spring comes on: and to confirm this opinion, he instances the practice of the gardeners at Montreuil, near Paris, who have for some generations



been famous for the culture of peaches, and are as careful to dung the borders where their peach trees grow, every other year, as the kitchen gardeners are for their legumes. He thinks neats or hogs dung, mixed with loam, six or eight months before it is used, and mellowed by frequent turning during that time, the best for a loose or sandy soil, because this dressing is cooler than any that is made with horse dung; and he thinks this last, mixed with light sandy earth, or sea coal ashes, the most proper for strong land.

The chief difference between the management and pruning of peach and nectarine trees, and those of *Apricots*, arises from this circumstance, easily attended to, *viz.* that, as Apricot trees produce their fruit, not only upon the last year's wood, but also upon cursons, or spurs, which issue from the two years wood; great care must be taken not to hurt or displace these in the summer trimmings, and to shorten the branches only in the winter pruning, to make them produce fresh wood wherever it is wanted.

*Cherry* trees will not bear to have their shoots shortened, for it is at their extremities that they produce many of their fruit buds, and the cutting them off not only lessens the future crop, but also frequently occasions the death of the whole shoot. Their branches, when they are planted against a wall, (though I cannot think this a proper method of cultivating the cherry tree, for reasons before assigned,) should therefore be trained in at full length, horizontally, and wherever there is a vacancy in the wall, some strong adjoining branches should be stopped, to make them produce new shoots to fill it. All fore-right shoots and ill situated buds should also be rubbed off, or displaced, at the same time; for if they are suffered to grow large, and are then cut off,  
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the tree will gum in that part (for cherry trees are hurt by the knife more than any other fruit trees): but care must be taken not to rub off the sides, or spurs, which issue from the two or three years old wood; because it is upon them that the greatest part of the fruit is produced, and they will continue fruitful for several years. It is for want of duly observing these cautions, that cherry trees are often seen so unfruitful; especially the morello, which, the more it is cut, the weaker it shoots, till it often is at last destroyed by frequent pruning.

*Plum* trees produce their fruit not only upon the last year's wood, but also upon cufsons, or spurs, which come out of the wood that is many years old: so that there is not a necessity for shortening the branches, in order to obtain new shoots annually, in every part of the tree (as must be done with peaches, nectarines, &c.); since the more these trees are pruned, the more luxuriant they grow, until their strength is exhausted, and they then gum and spoil. The safest method to manage plum trees is therefore, to lay in their shoots horizontally, as they are produced, at equal distances, in proportion to the length of their leaves: and where there is not a sufficient quantity of branches to fill up the vacancies of the trees, there the tops of the branches may be pinched off in the beginning of May, as before directed for peach trees, to make them put out lateral shoots to supply those chafms. This, and the displacing of all irregular and fore-right shoots and buds, as fast as they are produced during the growing season, will render these trees beautiful and flourishing, and there will be but little occasion for cutting them in the winter, which is of bad consequence to all sorts of stone-fruit; because, by shortening of their branches, the fruit is cut  
away,



away, and the number of shoots increased: for whenever a branch is shortened, two or more shoots are commonly produced from the eyes below the cut. This, with unskilful pruning, crowds the tree with such numbers of branches, that it produces only small and ill tasted fruit; and by not allowing it a sufficient space to spread in, at the time of planting, occasions, what is too often seen, that every branch of a fruit tree, howsoever improper for it, undergoes the destructive discipline of the knife. The only way to avoid this mangling, is to give the trees ample room, and to extend their branches at full length.

*Pear* trees may be pruned at any time after their fruit is gathered, until the beginning of March; but the sooner it is done, the better: though the deferring of it till spring is not so injurious to these, as it is to some of the tender fruits. They generally produce their blossom buds first at the extremity of the last year's shoots, so that if these are shortened, the blossoms are cut off, and by means of the new shoots which are then produced from the eyes immediately below the cut, the tree becomes too much crowded with wood: besides which, if the buds which are thereby made to put out shoots were left untouched, they would produce cursons, or spurs, and these would bear fruit. The growth of a pear tree shoot should therefore never be checked, unless there be a necessity for new wood to fill up a vacancy; but the branches should be trained horizontally as far as they will go. Mr. Miller says<sup>h</sup> he has seen them upwards of twenty feet long from the trunk of the tree, and fruitful their whole length; for their cursons or spurs, which continue fruitful many years, are frequently emitted from branches three or four years old. The chief point there-

<sup>h</sup> *Gardener's Dict.* Art. PYRUS.



fore is, to look them over carefully in the growing season, to rub off all misplaced buds and shoots, and to train in such of these as are left, regularly to the wall. By managing them thus in the summer, and displacing all luxuriant shoots as soon as they are produced, these trees will want but little pruning in the winter.

The same care as was before directed for peaches, to water the trees, to keep the earth loose about them, that it may the better admit rain and dew to their roots, and to lay mulch upon it's surface over the roots, is equally necessary here, after the fruit is set, and whilst it grows: and so it likewise is to recruit the soil with some such dressing as was there advised, in the autumn of each alternate year. A thorough trenching of the ground every winter will also be of signal service to these, and indeed to all other fruit trees, especially when they begin to be old, provided due regard be paid to their roots; for unless these are rightly attended to, their heads cannot be expected to thrive.

In the gathering of pears, great care should be taken not to injure the bud which is always formed upon the same spur, close to the bottom of the foot stalk of the fruit, for the next year's blossoms. This is often spoiled, by forcing off the pear before it is ripe: but if the fruit is left till it has acquired a proper maturity, and then gently turned upward, it's foot stalk will part from the spur without hurting the bud.

All summer pears should be gathered as they ripen; for none of them will remain good above a day or two after they are taken from the tree, nor will many of the autumn pears keep good above ten days, or a fortnight, after they are gathered. The winter fruits should hang upon the tree as long as the season will permit without danger of their being nipped by the frost; for  
when



when this happens to them, their juices become flat and ill tasted, and they rot soon after. If the season continue mild until the end of October, that will be a good time for gathering them: but this must always be done in dry weather, and when the trees also are perfectly dry. As they are gathered, they should be laid gently, one by one, in a broad flat basket, with great caution not to bruise them; and when they are carried into the store room, they should be taken out singly, and each sort be laid up by itself in a close heap on a dry place, to sweat for ten days or a fortnight, during which time the windows should be open to admit the air, in order to carry off the moisture that is perspired by the fruit. The manner of keeping them afterwards, and that for a considerable length of time, being nearly the same as for apples, will be spoken of fully in the Article of standard fruit trees.

*Fig* trees will thrive in almost any soil or situation; but they will not produce fruit unless they stand in a free open air. They yield the most, and best, upon a strong loamy soil, or upon a gentle loam about a foot or a foot and an half thick, lying over chalky land. When they are planted in dry ground, their fruit is apt to drop off in May and June, if that season be also dry. To prevent this, the trees should be well watered, and the ground covered with mulch, to render it somewhat moist.

In warm countries, these trees are raised from their seeds; but in England they are propagated by suckers from their roots, by cuttings, or by layers. Suckers are a bad method, for reasons before repeatedly assigned. The cuttings, which should be taken from the trees in autumn, because they are then least liable to bleed, must be chosen from the most fruitful, compact, and shortest jointed branches, and they should have a part of the  
former



former year's wood at their bottom. The top should be left entire, and not be shortened, as is usually practised with other cuttings. If they are laid in a shady place for two or three days before they are planted, their wounds will be healed over, so as to prevent their being rotted by bleeding. They should then be planted eight or nine inches deep, in a bed of loamy earth, in a warm situation; the surface of the ground should be covered three or four inches thick with old tanner's bark, to keep out the frost; and if the winter prove severe, their tops should be covered with peas haulm, fern, or some other light covering, to protect them from the inclemency of the weather. This covering should be taken off gradually in the spring, as soon as all danger of frost is over; but the tan may remain, to prevent the drying winds of the spring, and the sun in summer, from penetrating the ground so as to hurt the young plants. These cuttings will be rooted sufficiently by the following autumn, when they should be transplanted into the places where they are to remain: and here again it will be right to shelter them with straw or haulm during the ensuing winter.

Layers are the best method of propagating this fruit. These, like the cuttings, should be made from woody, compact, and well ripened shoots of the most fruitful trees; and not from young shoots full of sap, whose vessels are large and open, and consequently very apt to bleed greatly. The best time for laying down the branches is in autumn. If the winter should prove very severe, it will be right to cover the ground about them with some old tan, or any other sort of mulch, to keep the frost from hurting them, and in the autumn following they will be sufficiently rooted to be separated from the mother plant. It is best to transplant them into the places where they are



to remain, as soon as they are thus cut off; though they may be left in their first place of growth till the spring, and be transplanted then: but they should always be separated from the old plants in the autumn, because they are not then so full of sap as in the spring; nor do they well bear transplanting when they are large. After they are planted out in the autumn, the surface of the ground about their roots should be covered with mulch; and if the winter should prove severe, it will be proper likewise to cover their tops with reeds, straw, haulm, &c. as before directed for the cuttings.

These trees are always planted as standards in all warm countries: but in England they are generally planted against walls; though experience shews, from the few old standards which we have, that they ripen their fruit full as well, if not better, upon standards, than against walls, and that the former generally yield the greatest crop. Mr. Miller is therefore clearly of opinion, that they should be planted either in standards or in espaliers, the last of which he thinks will succeed best in this country. I shall speak of both in the next ensuing articles, and only give here his method of pruning this tree, with such general directions as are proper to be observed when it is trained against a wall.

The branches of fig trees must never be shortened when they are pruned, because all their fruit is produced at the upper part of the shoots of the preceeding year; and besides, the branches are very apt to die after the knife. The best way therefore is, when these are too close together, to cut out all the naked branches quite to the bottom, and to leave only, at a proper distance from each other, those which are best furnished with lateral shoots. That distance should not be less than



than a foot, and the lateral shoots should be laid four or five inches asunder. These trees should be pruned in the autumn rather than in the spring, because, like all other trees, they are least replete with sap in the former of these seasons, and consequently then least liable to bleed\*. Their branches should also then be divested of all the autumnal figs; and the sooner this is done after the leaves begin to fall off, the better the young shoots will resist the winter's cold.

In some very cold and moist seasons, the young shoots of fig trees will not harden, but remain soft and full of juice. When this happens, there is little hope of a crop of fruit the succeeding year; for the first frost in autumn will kill the upper part of these shoots, for a considerable way downward. The best way then is to cut off all the decayed part of the shoots, to prevent the infection from spreading to the parts which are sound. It is chiefly from the four or five uppermost joints of the shoots that the fruit comes out; and for this reason as many as possible of the short lateral branches should be preserved, and particular care should be taken to promote a supply of young shoots in every part of the tree.

Fig trees reared against walls should be un-nailed at the approach of winter, and after having divested them of their remaining leaves, and of all the latter fruit, which hardly ever ripens in this country, (though the second crop, produced from shoots of the same year, is the principal one in warm climates,) their branches should be laid down towards the ground, tied together in small

\* A vigorous branch of a fig tree broken or cut off in the autumn will cease to bleed in one day's time, or less; whereas a branch cut in the spring will often flow a week, or more, and the wound will be proportionably longer before it heals. MILLER'S *Gardener's Dict.* Art. FIGUS.



bundles, and, after being fastened to stakes, to prevent their touching the earth, for fear of the damp which might mould them, as well as to secure them from being broken by the wind, they should be covered over with straw or litter, to guard them from the frost. This covering should be taken away gradually in the spring, as the danger of frost decreases. The fact which I before hinted at <sup>m</sup> in regard to the mistaken notion of benefiting fruit trees by planting them against walls, is remarkably evident from fig trees, which, in this country, almost always produce greater quantities of fruit when they are planted against walls which have a north or an east aspect, than when they are set to a south or a south east wall; because the fruit of these last is pushed out so early in the spring, especially if the beginning of that season be at all warm, that the cold, which seldom fails to return here in April and May, nips the greatest part of it, and causes it to drop off; whereas that of the former, which comes out later, generally escapes this danger: much more will they be free from this accident when the trees are planted in espaliers, or standards.

Some persons who are very curious in their fruit, and who do not mind a little extraordinary expence, erect against their walls trellises which extend from the inside of one pier to the nearest inside of the next; where the walls are built with piers, as they must be for this purpose <sup>n</sup>. This frame work is constructed in the same manner as that for espaliers<sup>o</sup>, like which it need not be set up till the trees are well spread, and begin to bear fruit plentifully; for they may be

<sup>m</sup> Page 231.      <sup>n</sup> See before p. 16.

<sup>o</sup> For the manner of constructing espalier frames see the next Article.



trained till then against any ordinary low espalier of ash poles or other slender sticks, in order not needlessly to expose the trellises to the injuries of the weather; because these, being generally made of regularly cut yellow deal, or oak, and run up higher, cost more. Every fourth upright rail or post of the trellis should be much stronger than the rest, and fastened to the wall with iron hooks, which it is best to fix in the wall at the time of building it. These strongest upright posts should be about three, but by no means more than four feet from each other. The cross rails may be slight, as for common espaliers; but they must be laid much closer together. For peach, nectarine, and apricot trees, for example, which, for the most part, produce their fruit on the young wood, the squares of the trellis frame should not exceed three or four inches; but for trees which continue to bear on the old wood, they may be five or six inches wide, and for vines, eight or nine inches. The shoots of the trees are fastened to this frame with ozier twigs, rope yarn, or any other soft bandage, in the same manner as they are to espaliers: for they must not be nailed to either, because that would injure the wood work.

These trellises, which should project about two inches from the wall, are thought to contribute greatly to preserve the beauty of the fruit, by preventing it's lying too close to the wall, whilst it has at the same time all the advantages of the heat reflected therefrom: nor are the walls where these are used hurt by driving nails into their joints, and drawing them out again every year, at the hazard of pulling out some of the mortar with them, and consequently of weakening the wall, and making holes in which snails and other vermin take shelter and breed.



Where it is not intended to have trellises, though the walls are built with piers, the planting of each tree in the middle of the space between the piers will form a regularity pleasing to the eye: but if trellises are to be erected, the trees should be planted against the piers, that their branches may be on a square with the rails to which they are to be fastened.

## A R T I C L E V.

### *Of the management of Fruit Trees in Espaliers.*

**T**HE trees for espaliers should not be planted at so great distances as against walls, because, if their branches are extended to a very great length, they have not so steady a support, nor can their gaps be filled up so equally with bearing branches; the want of which creates a great deformity to the eye.

The espalier, or frame, to which the trees are to be trained, should not be made till the third year after they are planted; for a few short stakes driven into the ground on each side of them, to fasten their branches to in an horizontal position, as they are produced, will be sufficient to train them properly to the form in which they are to grow. The cheapest way of making these espaliers is with ash-poles, of two sizes, *viz*, large ones, cut about six feet and an half long, for upright stakes, which must be sharpened at their biggest end, and driven into the ground at a foot distance from each other, in a strait line, and at an equal height of about five feet from the ground; and slender ones, to be nailed along upon the tops of the upright stakes, to keep them exactly even; and also to cross them, at about nine inches distance row from



rom row, from the top to the bottom. These cross poles should be fastened to the stakes with wire; their ends should be cut flat, and nailed to them, for greater security against high winds and other accidents; and if the whole is painted over, or oiled, it will last a long while. Espaliers made with square timbers, cut to suitable sizes, are indeed more sightly; but they are much more expensive, and neither last longer nor answer the purpose at all better, than the former.

When the espalier is thus framed, the branches of the trees must be fastened to it with small osier twigs, rope yarn, or some such binding; observing to train them in an horizontal position, and at equal distances proportioned to the size of the fruit and of the leaves; and with care not to cross any of them, or to lay them in too thick. The branches of the largest fruits should be at least six or eight inches asunder; but four or five will be sufficient for those of lesser growth.

The trees chiefly planted for espaliers are *Apples*, *Pears*, and some *Plums*. The dutch stocks, as the gardeners call them, are reckoned the best for apples, and quince stocks for pears, when trained in this method, because they prevent the trees from growing too luxuriant, make them produce fruit pretty soon, and continue many years in vigour. But, though I differ herein from perhaps all gardeners, the golden pippin seems to me almost the only apple really fit for espaliers\*. The professors

\* The Golden Pippin is a fruit peculiar to England. There are few other countries where it succeeds well; nor does it produce so good fruit in many parts of this, as were to be wished. This is in some measure owing to it's being grafted on free stocks, which enlarge the fruit, but render it less valuable, because it's flesh is then not so firm, nor it's flavour so quick, as they ought to be, and it is apt to be dry and mealy. It



professors of this art have indeed given a long list of other sorts: but I leave to those adepts the care of managing them properly, if they can, when cultivated in this way: for it is certain, that most of them, and especially the nonpareil, which they recommend particularly for this purpose, love to run up in standards, and that they bear the best and highest flavoured fruit when they are reared as such.

With regard to *Pears*, the summer and autumn kinds may do well enough in espaliers, if they are of the small species; but the luxuriant large sorts or the winter kinds, will not: and as to *Plums*, in general, they seldom prosper rightly in this way; first, because they shoot greatly; and secondly, because they cannot bear so much cutting as is commonly used in this method: for it may be laid down as a constant rule, that trees which will not bear much pruning are not fit for espaliers; because there will consequently be gaps not easily filled up, and their gumming, or bleeding, is an insuperable obstacle to their lasting long.

*Cherry* trees are by no means fit for espaliers, because they are very apt to be killed by cutting, to gap extremely, and to be blighted in this situation: neither should they, for these reasons, be planted against walls.

In the pruning of apple trees, the chief point is, never to shorten any of the branches, unless there be an absolute want of wood to fill up the vacancies in the espaliers; for where the knife is much used, it only multiplies useless shoots, and prevents their fruiting; so that the best way of managing these trees is, to look them over care-

therefore should always be grafted upon the crab stock, which will not canker like the others; and though the fruit will not be so fair to the sight, yet it will be better flavoured. MILLER'S *Gardener's Dict.* Art. MALUS.

fully



fully in the growing season, to rub off all such shoots as are irregularly produced, and to train the others down to the frame work, in the position they are to remain. If this is carefully performed in the summer, little will remain to be done in the winter; and by bending their shoots down from time to time, as they are produced, there will be no occasion to use force to bring them to a proper situation, nor any danger of breaking the branches. The distance at which these branches are trained from each other should be about seven inches for the largest sorts, and four or five for the smaller. — All apple trees produce their fruit upon cufsons or spurs, so that these should never be cut off; for they will continue fruitful a great number of years.

The very circumstance of these trees not bearing the knife, is an argument against their being fit for espaliers, and for their being proper to be raised only as standards.

It will add greatly to the beauty of the espalier, if only such trees as grow to an equal height, or as nearly equal as can be, are planted in the same row. However, all of them should be spread low, horizontally, that their fruit may enjoy the benefit of the heat of the sun reflected from the earth; much rather than be suffered to run up high. The largest growing sorts of apple trees, when planted for espaliers, should be allowed from twenty five to thirty feet, those of middle growth about eighteen feet, and the smallest, such for example as the golden pippin, at least twelve feet, to extend themselves in.

When the trees are arrived at the full extent allowed them in the espalier, it becomes indispensably necessary to cut them so as to keep them within the intended limits. For the reasons already given, the winter is the only time for doing this, because,



because, the sap being then at rest, the growth of the fruit buds will not be interrupted by the rising of young shoots. This is a precaution so little attended to, and indeed so generally counteracted, that I would recommend it to the particular observation of all gentlemen gardeners; for it is for them chiefly that I here write.

To the great advantage which espaliers have over walls, in that, as before hinted <sup>p</sup>, they do not, like them, reflect cold and blighting winds, and are more easily sheltered by fixing up against them the reed skreens already mentioned <sup>q</sup>, in the spring, when the trees are in blossom, and letting them remain till the fruit is out of danger; and also in the autumn again, if that season should prove bad, for they <sup>\*</sup> will then forward the ripening of the fruit, and prevent it's being blown down by high winds; I must here add, that when the roots of the espalier trees have reached the well loosened ground within the quarters of the kitchen garden, the trees themselves, finding there a more plentiful supply of food than those which are planted against walls can meet with in their confined borders, will flourish with redoubled vigour. The borders of the espaliers should also be well dug, or forked, from time to time, to prevent their growing hard; and it will be right to enrich them with a good dressing, every other year, as before directed <sup>r</sup>.

*Fig* trees are cultivated in espaliers, with good success, in many parts of Germany. The method

<sup>p</sup> Page 232, 235.

<sup>q</sup> Page 234.

<sup>\*</sup> These reed hedges may be purchased for one shilling a yard, running measure, at six feet and an half high; and if they are carefully laid up, when done with, under a shed, or otherwise, so as to be kept from the weather, they will last seven or eight years.

<sup>r</sup> Page 251, and 255.

there,



there, which it would be advisable to follow in this country, is, to loosen their branches at the end of autumn, and then to tie them in bundles and cover them with straw, or haulm, as before advised<sup>s</sup> for those that are planted against walls. They are thus preserved from the injury of cold during the winter, and are fastened up again as soon as the danger of frost is over. The trees thus managed generally produce great crops. Their culture is, in other respects, the same as before directed<sup>t</sup>. Reed hedges are also of great service here, by placing them every night on each side of the espalier, whenever there is danger of cold winds or frosty nights, and taking them away in the day.

## ARTICLE VI.

### *Of the management of Standard Fruit Trees.*

**T**O the directions before given for raising, grafting, transplanting, and training such stocks as are intended for standard fruit trees, and to the advantages which these receive, not only from their situation, but also from their not being hacked and mangled with the knife, as all espalier and wall trees are in order to keep them within certain stated forms and limits, howsoever repugnant this may be to nature<sup>t</sup>; I must here add, as properly belonging to this head, though at the hazard of repeating what has been already said, that these stocks should not exceed two years growth from the bud, or graft, when they are planted; that they should be fastened to stakes till they have acquired sufficient strength not to be in

<sup>s</sup> Page 259.

Page 256—260.

<sup>t</sup> See the preceding ARTICLES I, II, and III.



danger of being blown out of the ground; and that the sole art of pruning them, when grown up to be trees, consists in cutting out all such irregular cross branches as, if left, would rub against and gall others, when agitated by high winds, and also all decayed branches; but that none of the shoots of these trees should ever be shortened. All suckers or shoots from their stem or roots should be removed as soon as they appear; and when any branches are broken by the wind, or other accident, these should be cut off, either down to the division of the branch, or close to the stem from whence it was produced. The best time for this work is in November; for it should not be done in frosty weather, nor when the sap begins to be in motion in the spring.

If these trees grow top-heavy, so as to endanger their being broken by winds, it is necessary to lighten the upper burden. This should be done by cutting off part of the large branches, and leaving a leading branch to carry on the circulation, rather than by taking a branch off quite close to the body; because this must necessarily leave a large wound, which, by affording lodgement to water, will endanger the rotting of the tree. The most effectual way to prevent this accident whenever any considerable part is cut off, is, to cover the wound with grafting clay or wax, and to tie over that a piece of tarpawlin, or of sheet lead.

As it never is advisable to place many standards in a kitchen garden, because their shade and the dripping of their leaves would injure the plants within their reach; I need not here mention the distances at which they should be set. That will be directed when I come to speak of the Orchard, to which it properly belongs to have a great number of these trees. A few of them may indeed, as

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is the general custom, be set here and there in the quarters of large gardens, without their doing much hurt: but the more irregular parts of the garden, of which there seldom fails to be several about the skirts of extensive grounds, are fittest for these trees; especially if they be such as are apt to grow to a large size. The smaller kinds are preferable for the inside of the quarters. Among these I class particularly all the stone fruits: for I cannot agree with any of our professed gardeners, in thinking that none of these species, except the Breda and the Brussels's apricots, are fit for standards; because I am convinced, as well from the experiments before related<sup>u</sup>, as from several others, and from the very nature of the thing, that, taking one year with another, all fruits are more perfectly ripened, and consequently acquire a higher flavour, upon standard trees, than in espaliers, or against walls. Their size may indeed be smaller, and their appearance less beautiful to the eye: but their superior goodness will make ample amends for these comparatively trifling deficiencies.

I therefore have nothing farther to say on this head, unless it be, to speak of the culture of such fruit trees, fit for suitable places in the kitchen garden, as do not belong to either of the foregoing articles of Espaliers and Walls: and to complete my promise in regard to the preservation of fruit laid up for keeping.

*Almond* trees have a beautiful effect in a garden whilst they are in bloom; and accordingly they are cultivated in this country, more for the sake of their flowers, than for their fruit: though this last is also well worth attending to, and may, with proper care, in a well sheltered warm situation, be produced very good in England.



These trees are propagated by inoculating a bud of them into a plum or a peach stock, or into a stock of their own kind, in the month of July. The next spring when the buds shoot, is the time to train them up, either for standards, or for half standards, as the cultivator chooses: though the usual method is to bud them at the height intended for their stems. In the second year after budding, they will be fit to transplant into the places where they are to remain. The best season for doing this is in October, as soon as their leaves begin to decay, if they are to stand in dry ground; but if they are to be removed into a wet soil, February is a far more preferable time. It is likewise to be observed, that plum stocks will always prove the best for this last, and almond or peach stocks for the former situation.

The blossoms of these trees often appear in February, when the spring is forward: but if frost comes on while they are out, their beauty is of short duration, for they are at once destroyed, and they then produce very little fruit. On the other hand, if these trees do not flower till late in March, they seldom fail to bear plenty of almonds, many of which will be very sweet, and fit for the table when green: but they will not keep long.

*Fig* trees (the method of propagating which, and of training them to walls and espaliers has already been given <sup>x</sup>,) are, from experience, found to produce the greatest crops of fruit when they are reared as standards. But yet, such is the force of prejudice, the custom of planting them against walls still prevails among us, notwithstanding the contrary example of other nations, and particularly of those which are most famous for

<sup>x</sup> Page 256, 259, 266.



the culture of these trees. They always make them standards, and constantly find their account in so doing. The mistaken notion that their branches are then most liable to be killed by frost, in severe winters, may be easily and effectually got over, by tying together as many of them as can be conveniently brought into a bundle, and then wrapping them over with hay-bands, straw, haulm, or some other light covering, which should be taken off gradually in the spring, in order not to expose the shoots too suddenly to the open air. The same may also be laid round the stems, and upon the ground about their roots, for a yet farther security, if it be thought necessary: but in doing this, great care should be taken that neither rats nor mice harbour in this covering; for they will eat off the bark of the shoots, and thereby kill them. Mr. Miller has often observed this in many of the largest branches of fig trees which were planted against walls<sup>y</sup>. The winter is the time when these vermin do this mischief; and therefore they should be carefully watched at that season.

The common blue fig, and the common white, are the sorts most generally cultivated in England. This last is a great bearer, and its fruit is very sweet: but neither it, nor the former, is to be compared to the brown or chefnut-coloured Ischia fig, or the small white early fig, for hardiness or for taste. These are not easily hurt by any of our frosts; and their fruit ripens so well with us, that they have been known, not unfrequently, to produce a tolerably good second crop, in this country, when the seasons have been favourable. The Ischia fig, which is purple within, is highly flavoured, and grows to the largest size of any of

<sup>y</sup> Gardener's Dict. Art. FIGUS.



this kind of fruit. The white early fig is white within, and sweet ; but not high flavoured.

*Filberts* may be propagated by sowing their nuts in February, till which time these should be kept in sand, in a moist cellar, where no vermin can get at them : but the most expeditious way, and the surest to obtain the sorts desired, is to raise them from layers.

*Medlar* trees may be raised by grafting or budding them upon the common white thorn. This is the usual way of propagating the American sorts (which are of the haw-thorn kind); but the best way to raise the other sorts is from their seeds. All medlars will take when they are grafted or budded upon each other. They will also take upon stocks of pears, or of quinces, and both of these will take upon the medlar ; so that there is a great affinity between them. All the American sorts will grow twenty feet high, if they are not stunted by grafting.

Medlars may also be raised from their seeds, which, if put into the ground in autumn, soon after they are ripe, will come up the following spring : but if they are not set till the next year, they will not shoot till the year after.

*Mulberry* trees may be raised either from seeds, from cuttings, or from layers. The branches (which are laid down for layers will take sufficient root in one year, and should then be separated from the mother tree. But as these branches, which should always be the most fruitful that can be singled out upon an old tree, for those of young ones are not near so good, nor is the fruit of these last ever so large or so well flavoured as that of the former,) are often situated so high that they cannot be layed otherwise than by raising up to them boxes or baskets of earth, and supporting them there till the layers have taken root, and are

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cut off; it is found to be more convenient to propagate these trees by cuttings; for these, if rightly chosen (likewise from the most fruitful branches of old trees), and skilfully managed, will take root very well; and, which is an advantage peculiar to this method, they may be brought from distant trees. These cuttings, which should be shoots of the former year, with one joint of the two years wood at their bottom, should not be shortened, but buried their full length, so as to leave only two or three buds above ground. The best time for planting them is in March, after the danger of hard frost is over. They should be set in light rich earth, such as is that of most of the old kitchen gardens about London; for that is the soil in which the mulberry tree delights, provided it be also very deep\*. The ground should be pressed close about the cuttings; and if they are covered with glasses, their rooting will be forwarded. Where these are wanting, the surface of the earth about them should be covered with moss, or mulch, to prevent it's drying; for they should be watered but little. If the cuttings make good shoots, they may be transplanted the next spring into a nursery, where their stems should be trained up regularly, by fastening them to stakes, and pruning off closely all their lateral branches, except perhaps two or three of the weakest, which

\* Mr. Miller observes, that he has seen in some of those gardens mulberry trees of a very great age, which are extremely healthy and fruitful, and that their fruit is larger and better flavoured than that of younger trees: but that he has never yet seen any mulberry trees which have been planted in a very stiff soil, or in shallow ground, either upon clay, chalk, or gravel, thrive or bear well. So far from it, that the stems and branches of these have always been covered with moss, and what little fruit they have sometimes yielded has been small, ill-tasted, and late before it ripened. *Gardener's Dict. Art. Ficus.*



may be left to carry on the circulation of the sap, for the increase of the stem: for when they are totally divested of their side shoots, all the sap is drawn up to the top, and the head then grows too fast for the stem, and becomes too heavy to be supported by it. After about four years growth in the nursery, these trees will be fit to transplant where they are to remain: for they may be removed with greater safety while young, than when they are of a large size.

Mr. Miller has found the cuttings of mulberry trees take root much sooner in a hot bed, than in the common ground: but either there, or in any other place fully exposed to the sun, they should be shaded with mats during the heat of the day, till they have taken root.

The only pruning which this tree requires, is, to cut away all dead wood, and to displace such cross branches as would otherwise be apt to rub against, and to gall, each other: for as it produces it's fruit upon shoots of the same year's growth, which proceed from buds at the extremities of the former year's wood, none of these should ever be shortened.

The white mulberry is the sort which is cultivated in France, Italy, Spain, and other parts of Europe, and, I believe, in America, for it's leaves to feed silk worms: but the Persians and the Chinese always make use of the common black mulberry for that purpose; and it is said by some who have tried both, that the worms fed with the leaves of this last, produce much better silk than those fed with the former. To this is added, that the leaves of the black sort should never be given to the worms after they have eaten for some time of the white, lest they should burst them.

The white mulberry is as hardy as the black, and may be propagated in the same manner: but

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the most expeditious way of raising numbers of these trees is from their seeds, which may be had in plenty from the south of France, or Italy. The best way of sowing them here is upon a moderate hot bed, where they should be covered about a quarter of an inch deep with light earth: and the most proper time, for this country, is about the middle of March. The plants will come up in five or six weeks: but as they are tender at first, the hot bed should be arched over with hoops, and these should be covered with mats, to shade the plants in the heat of the day, and to protect them from cold at night: and it should be watered pretty frequently in very dry weather. They must be kept clean from weeds during the ensuing summer, and sheltered again, as before, from the time that the frosts begin to come on in autumn. With this management, for they do not require any other culture, they will be fit to transplant the next March into the nursery, where they may remain two or three years, to get strength; and then they should be removed into the places where they are to remain.

The trees which are intended for feeding of silk worms should not be suffered to grow tall, but should rather be kept in a sort of hedge; and instead of pulling off their leaves one by one, it is better to clip them off with a pair of shears: for this is much sooner done, and with less detriment to the tree. — The author of one of the papers in the *Philosophical Transactions*<sup>y</sup>, speaking of the propagation of mulberry trees for the food of silk worms, seems to think that it may be a yet better way to sow some acres of land with mulberry seeds, and to cut the plants with a scythe, so as to keep them always low: and Dr. J. Beale, in the same valuable collection<sup>z</sup>, is of

<sup>y</sup> No. 12.<sup>z</sup> No. 116.



opinion, that, wherever the mulberry tree grows, there the silk worm will live and spin good silk.

*Quince* trees are easily propagated, either by suckers, or cuttings, planted in a moist soil. Suckers are the worst to raise them from, for reasons before assigned; and cuttings are generally preferred to layers, because they are of more speedy growth. These cuttings should be set early in the autumn, and should be watered often, to encourage their rooting. In the second year after planting, they will be fit to remove into the nursery, where, after being set a foot asunder in rows three feet distant from each other, they should be managed as before directed for apples. After two or three years growth in the nursery, they will be large enough to transplant into the places where they are to remain. A moist situation, such, for example, as the side of a river, pond, or ditch, will make them produce the most, and the largest, fruit: but that which grows on a dry soil will be better tasted, and earlier ripe. These trees require no other pruning, than keeping their stems clear from suckers, cutting away all cross branches, and displacing all upright luxuriant shoots from the middle of the tree, that it's head may not be too much crowded with wood: for that is of bad consequence to all fruit trees. A sure way to have the best sorts, is to graft or bud them upon stocks of their own kind raised from cuttings. The trees so managed will bear fruit much sooner, and more plentifully, than those which are raised from suckers or layers. — The Portugal quince is the most valuable.

Having now pointed out the several methods of obtaining each sort of fruit from the tree, it will be right to consider the means by which it's possessor may best and longest preserve that sweet reward of his expence and care; whether it be, in  
order



order to enjoy the laudable pride of entertaining his friends, with the salutary product of his own labour; or, if profit be his aim, to keep it till it will fetch a price proportioned to the advance which every commodity bears when it is scarce.

To proceed the more rationally in this inquiry, it will be proper to examine, first, what it is that hastens putrefaction in fruit, and then to consider the means of guarding against every such cause.

Thousands of objects teach us, that moisture and warmth are the great causes of putrefaction. From the decay of many otherwise lasting bodies, we learn, that the alternate changes of heat and cold, of dryness and moisture, moulder to pieces even the solid oak. These general causes of putrefaction and decay should therefore be avoided, or prevented, as much as possible: and to this end an equal state of the air, with regard to heat and dryness, becomes necessary in a repository for the preservation of fruit. The want of dryness renders cellars, in general, unfit for this purpose: though some of them may, perhaps, be dry enough; and if they are, the other requisite, of an equal state of heat, is usually found in them: but as this is not often the case, it is surely worth the gentleman's while to provide a receptacle on purpose for his fruit. A closet surrounded every way with good walls, and furnished with double doors, promises the best success. In this closet, different compartments, or bins, may be made of brick, which continues much drier than stone or wood. Large jars, or casks, will also answer the same end, when they are closely stopped; and so do boxes, as it well known to the London fruiterers. Either of these may be proportioned to the quantity which it is advisable to keep in each: I mean, to the quantity that is to be consumed within a few days; for even in such a place, the fruit



should be exposed to the air as little as can be, before it is eaten. Experience will soon shew to the good manager the importance of this caution. — Eggs afford a manifest instance of the advantage of a seemingly slight protection from the ingress and egress of air, by the long while (some months) that they will keep sweet and fresh, when covered all over, uniformly, with only a thin coat of any unctuous matter.

Chance convinced an excellent and attentive housewife of the success of such care as is here recommended for the preservation of fruit. Her residence was then in Switzerland, where the houses are generally built of stone, with thick walls, in which there frequently are cupboards, if I may so call them, which shut with doors exactly fitted to them. In one of these, this lady put a plate of fruit, I think it was summer fruit; but I will not be positive as to that circumstance, having lost the memorandum which I made of this fact when it was related to me. Likewise by chance, this cupboard was not opened till some months after, when, to her great surprise, the fruit was plump and sound, and had lost very little of its original flavour.

When the fruit (I here mean chiefly apples and pears, for they are the fittest for keeping,) has been carefully gathered by hand, in perfectly dry weather, and sweated for some days, in heaps on a clean floor, as before directed, till it has discharged its watery and crude juices; each apple or pear must be rubbed singly with a coarse cloth, to clean and dry them, and if the least hurt, or speck, tending to putrefaction, appears at this wiping, all the fruit so marked must be laid aside, as unfit for keeping. A layer of very dry straw should be laid at the bottom of the vessel, what-

ever



ever it be, in which they are to be preserved, and upon this a layer of perfectly sound apples, or pears; then another layer of straw over them, a layer of fruit upon this, and so alternately, till the whole intended quantity is put in. I have named straw, because it is easiest to come at: but any other substance which is perfectly dry, and least liable to corruption, will do. If, therefore, each layer of fruit is sheltered above and below with a covering of paper, to preserve it from the taste which saw-dust might give it, this bids fair to answer the desired purpose. On this principle it is that roots are preserved in sand: the only objection to which, for the use here intended, is, that it's weight may hurt the fruit: otherwise, it promises well, when perfectly dry.

## A R T I C L E VII.

### *Of Fruit-bearing Shrubs.*

**C**URRENTS are easily propagated by planting their cuttings in a spot of fresh earth at any time between the beginning of September and the middle of October. If they are set in rows, a foot asunder, kept clear from weeds, and watered in very dry weather, they will be fit to transplant into the places where they are to remain at the end of one year; or they may be left two in the nursery, where they should, in the mean while, be trained for their future destination, either by rubbing all the buds off their stems, to the height of about one foot if they are to be standards, or by rendering them flat, if they are designed for walls, pales, or espaliers. The younger they are planted out, the better they will succeed. The



best season for this is, soon after their leaves begin to decay, because they will then have time to take root before the winter comes on, so as not to be in danger of suffering from drought in the spring. The fruit of these shrubs is fairest to the eye when they are planted against espaliers, pales, or walls, for which their distance from each other should be ten or twelve feet. If they are set in rows, for standards, as is the common practice of the gardeners who cultivate their fruit for sale, the rows should be ten feet asunder, and the plants in the rows four feet from each other. Their fruit will ripen a fortnight or three weeks sooner against a south-east wall or pale, than it will in the open air; and it will be proportionably later against a north wall or pale; so that by these means it may be continued a long time in perfection, especially if the north pales are shaded with mats in the heat of the day, to retard the ripening of the fruit.

The pruning of these shrubs is very easy: for as they produce their fruit upon the former year's wood, and upon the small spurs (the gardeners call them snags) which come out of the old wood, the only essential things to be observed therein are, not to let their shoots grow too close together, and never to cut off their spurs.

These plants will thrive in almost any soil or situation: but their fruit is always best when they grow in the open air, and upon a light loamy soil.

The Champaign currant, which is of a pale red colour, and the white and the red Dutch currants, are the largest and the most esteemed. The black currant is banished from the table, on account of its strong disagreeable flavour: but a rob is made of it, which is of excellent use in cases of sore throats and quinsies.



*Goosberries* are propagated either by suckers taken from the old plants, or by cuttings. These last are by far preferable because they generally root the best, and are least apt to produce suckers, which always weaken the stock from whence they proceed. The cuttings should be taken from the handsomest shoots of the best bearing branches of the most fruitful shrubs: they should be about six or eight inches long, and should be taken off, and planted, in autumn, just before their leaves begin to fall, about three inches deep, in light earth, exposed to the morning sun. Their growth will be promoted by watering of them gently in dry weather, and they will be trained up regularly to a strait stem, if all their under shoots are rubbed off in the summer, as soon as they appear, so as to leave only the uppermost or strongest. In the next October, these plants will be fit to remove into a nursery, where, after trimming their roots, and cutting off all side branches, they should be set a foot asunder in rows three feet distant from each other, in an open spot of fresh earth, which has been well dug, and cleansed from all noxious weeds and roots. They should here be fastened to short sticks, or stakes, the more effectually to render their stems strait and upright; they should be cleared from all lateral shoots to the height of about a foot above the surface of the earth; and after one year's training in this manner (keeping them clear from weeds, and cutting out all cross branches, so that their heads may not become too thick), they will be fit to transplant to the places where they are to remain. The soil, for them to thrive to the greatest advantage, should then be a rich light sandy earth; though they will do very well in middling soils which are not too strong or moist, and in all situations. However, their fruit is best when they grow in an open exposure, and not within the shade of other trees. The best season



season for this transplanting is likewise in October, when their leaves begin to decay; and it will also be right then to trim their roots again, to divest them off all lateral and all cross shoots, and to shorten all their long branches, so as to make the head regular. The distance at which they should be planted now, if there be a large number of them, is eight feet row from row, and six feet asunder in the rows.

The gardeners around London, who raise great quantities of these bushes in order to supply the markets with their fruit, prune them soon after Michaelmas, and then dig up the ground in the abovementioned intermediate spaces, and plant it with coleworts for spring use. Their ground is by this means employed all the winter, without hurting the gooseberries; and the coleworts so planted often escape in hard frosts, when others which are less sheltered are often destroyed. This husbandry is well worth practising where land is dear, or where persons are confined for room.

The common practice of clipping the heads of these shrubs with shears, in order to give them a roundish form, is very wrong: because they become thereby so crowded with wood, that the fruit which they do produce never grows then to half the size that it would if the branches were properly thinned with a pruning knife, all the misplaced ones cut away, and the strong bearing shoots shortened to about ten inches, with care always to prune them off behind a leaf bud. With this management, with keeping the ground clear from weeds, with digging it at least once a year, and with bestowing a little rotten dung upon it every other year, the fruit will be near twice as large as that which is raised in the common way, and the shrubs will continue in vigour much longer.

The



The large white Dutch, the large amber, the early red, and the early green, both of which last are hairy, are generally reckoned the best sorts of goosberries: but many others, nominated from the persons who have raised them from seeds, such as, Lowe's goosberry, Lamb's goosberry, Hunt's goosberry, Edwards's goosberry, and many still newer varieties, which have been obtained by the means, and which it would be needless to enumerate here, are also much esteemed.

*Rasberries* are of three sorts; the common wild one, the large red garden raspberry, which is one of the pleasantest of fruits, and the white, which is little inferior to the red. All of them ripen about the beginning of July.

These plants are generally propagated by slips, or suckers, but layers are far preferable, because they will be much better rooted. Their fibres should be shortened when they are transplanted; but the buds which are placed at a small distance from the stem of the plant must not be cut off, because they produce the new shoots the following summer. A fresh strong loam, in a shady situation (Mr. Mortimer says<sup>a</sup>, even under a north wall,) is that in which they thrive best, and produce the fairest fruit, especially if they are planted two feet asunder every way, in borders of a moderate breadth: for if there be not room for the air to pass freely between them, they never produce their fruit in so great quantity, nor does this grow so large, or ripen so kindly, as when they stand at sufficient distances from each other. To promote this, they must be kept very clear from weeds; and to let the sun in among them to ripen their fruit, their heads are cut off, just above the bearing part, a fortnight or three weeks before the

<sup>a</sup> *Art of Husbandry, Vol. II. ART. RASBERRIES.*



fruit begins to ripen. It is upon this principle that Mr. Miller advises <sup>b</sup> setting them about two feet asunder in the rows, and leaving a space of four or five feet between row and row. March is the usual time for planting them.

When they are dressed, the season for which is in October, all the old wood, which produced fruit the preceding summer, should be cut down below the surface of the ground, and the young shoots of the same year must be shortened to the length of about two feet. The intervals between the rows should then be well dug, to lay fresh earth to the roots; and if a very little rotten dung is buried therein, the plants will shoot the more vigorously in the following summer, and produce the finer fruit. During the summer, they will require no other culture than keeping them clear from weeds.

These plantations should be renewed every third or fourth year; after that, their fruit dwindles greatly, both in quality and in quantity.

*Strawberries*, with which I shall close my account of garden fruits (though these do not strictly come under the title of this Article), thrive best, and bear most plentifully, on a light and moist hazely loam, not over rich. They may be raised from seeds; for by that means it is that we have obtained the scarlet strawberry, which is a native of Virginia; the hautboy, originally an American plant; and the Chili strawberry, which was first brought into Europe by M. Frezier, a French engineer; but the common, and most expeditious way of propagating them is from their runners, which easily take root at their joints, and there form plants, which, in two or three months, are fit to be cut off and transplanted. Those which

<sup>b</sup> *Gardener's Dict.* Art. RUBUS.



root earliest in the spring, and nearest to the mother plant, are the fittest for this purpose : and the best time for removing them is in October, that they may get new roots before the hard frost sets in. They should never be taken from old neglected beds, where the plants have been suffered to run into a multitude of suckers, nor from any but the most fruitful plants.

The ground in which they are planted must be well dug, and very carefully cleared of weeds ; and when it is levelled, it should be marked out into beds three feet and an half, or at most four feet wide, leaving a path way of two feet, or two feet and an half broad between them. These paths are necessary for the convenience of gathering the fruit, for weeding and dressing of the beds, and, which is of essential consequence to plants that remain so long in the ground as these do, to be frequently dug up, in order to lay fine fresh earth to the roots of the plants. Of the wood strawberry, which is a native of this island, but of the smallest growth of any, though greatly improved, both as to size and flavour, by culture in the garden, four rows may be planted, in a quincux order, at about eight inches from each other in the rows, and a foot distance from row to row, in the beds that are four feet wide : but three rows in a bed three feet wide will do much better, because these will be more benefited by the digging of the alleys. The scarlet strawberry must be planted at a foot distance every way, and the hautboy at sixteen inches. The Chili strawberry, which is the largest of all, must be set at about two feet distant from plant to plant. This last is found to succeed best under the shade of trees, in a very strong brick earth, approaching nearly to clay : but it seldom perfects it's fruit here, so as to answer the trouble of cultivation. In Chili, where



where it grows wild, the fruit of the larger sort (for there are two kinds, but neither of them fit for the open air in this country) is as big as a wall-nut, but not so well tasted as our own strawberries.

If the winter prove severe, some old tanner's bark, or if that cannot be easily procured, saw dust, sea coal ashes, or decayed leaves of trees, should be spread over the surface of the bed, between the plants, to keep out the frost. This care is absolutely necessary to the Chili strawberry, which is frequently killed in hard winters.

In the spring, after the danger of hard frost is over, the ground between the plants in the beds should be forked with a narrow three pronged fork, to loosen it and break the clods: and if the tan, or other covering, which was laid on in the autumn, is then mixed with and buried in the earth, it will be of service to the plants, especially in strong land. A covering of moss spread over the beds about the latter end of March, or the beginning of April, will not only keep the ground moist, by preventing the drying winds of the spring from penetrating it, and thereby contribute greatly to secure a good crop of fruit; but it will also preserve the fruit clean from that grit which is often thrown up by heavy rains after it is full grown, to the great detriment of it's flavour, because it must then be washed before it can be eaten.

When the plants begin to flower, they must be watered very plentifully if the season is dry, and great care must be taken to keep them clear from weeds. At Michaelmas, the beds should be forked again, the weeding should be repeated carefully, the alleys should be dug, and the weeds buried in them, all the strings or runners must be taken from the roots, and the plants should be thinned, by pulling up the weakest, wherever they stand too close together. The throwing of a little fine  
earth



earth over them, at that time, will also greatly strengthen their roots.

As these beds seldom continue good above three years, in the common way of managing them (though Mr. Miller, with greater care and judgment than is usually exerted, has made them remain in perfection four or five years), and as they yield but little fruit the first year; it is necessary to new plant some fresh ground every third year. When this is done, the old beds may be destroyed, and the ground converted to some other use, after the new ones have had one year's growth. But that strawberry beds may be made to yield good crops even for some years longer than the abovementioned usual term of their duration, is perhaps more than probable, if they are cultivated according to the principles of what is called the new husbandry.

The excellent M. de Chateaufvieux, among his numerous and judicious trials of that husbandry, upon different plants, applied it to strawberries, of which he planted several beds of well and deeply loosened earth, six feet wide, with single rows. The vigour of the plants, the largeness of their leaves, and the very great number of their roots, though cultivated only by stirring of the ground with the horse-hoe, without the least help of dung, manure of any kind, or watering even in the driest weather, gave him room to expect, before the first summer was over, that their fruit would be very large and plentiful the next year: nor was he disappointed; for in 1754, which was their second year, his "strawberries were admirable, "extremely large, finely scented, and of a very high "flavour". He continued the same method in 1755 and 1756, and with the same success as be-

\* DUHAMEL, *Culture des Terres*, Tom. IV. p. 455.



fore. In short, though the year 1755 was so extremely hot and dry, that no watering could well suffice to keep alive the plants that were managed in the common way; these remained constantly green, and in great vigour, and their fruit was, in every respect, finer than that on which the utmost care was bestowed in his kitchen garden<sup>d</sup>. Unfortunately for the public, M. Duhamel's account of that gentleman's interesting experiments comes no lower down than the year 1756: but I am not without hopes of obtaining from their illustrious author a copy of the observations which he may have made since that time. They cannot but be highly valuable: and if I should be favoured with them, I shall think it my duty to communicate them to my countrymen.

## S E C T. III.

## O F T H E O R C H A R D.

**T**HE best situation for an Orchard is a gently rising ground, open to the south-east, and defended from the west, north, and east winds, by somewhat distant hills, buildings, or plantations of tall trees. If these last do not offer naturally, they must be procured by art. A great declivity is by no means proper for an orchard, because heavy rains frequently wash down the finest part of the soil there, and of course leave the trees destitute of their necessary nourishment: but on a moderate slope, especially towards the south-east, they enjoy, among other advantages, the essential one of being most effectually cleared, by the sun and air, from fogs and damps, which would do them great injury if suffered to stagnate among them.

<sup>d</sup> *Id. ibid. Tom. V. p. 544.*



The soil of the orchard should be richer than that from whence the trees are taken, though, (which will depend on the forming of the nursery accordingly,) as nearly as may be, of the same nature; and it should be deeper than is usually deemed necessary for the kitchen garden. If it be pasture ground, or otherwise covered with turf, the sward should be plowed up in the spring before the trees are to be planted, so that it may have at least one summer's fallow, during which it should be well stirred and turned two or three times, to break the clods, rot the sward, and prevent the growth of weeds: but two years of this management, in the course of which it will likewise reap the benefit of the winter's frosts, will, together with frequent deep plowing, render it still more completely loose and mellow. Then will also be the time to use whatever manure may be requisite, in order to correct it's defects, and fit it for the reception of the intended plants. At the michaelmas immediately before planting, it should be plowed again (or rather dug), likewise pretty deep, to loosen it once more thoroughly, and the trees designed for it should be planted in October, if the ground be dry; but in the beginning of March, if it be wet.

Care should be taken to suit the quality of the ground as nearly as possible to the nature of the trees intended to be planted in it, according to the hints before given: for it is owing to a neglect of this important caution that numbers of orchards, in most countries, never arrive to any tolerable degree of perfection; but their sickly trees, half starved for want of nourishment, are either over-run with moss, or their bark cracks and divides; both of which are evident signs of their weakness: whereas, if the very same orchard, for example, which is injudiciously planted with



apples, had been planted with pears, cherries, or any other fruit better adapted to the soil, the trees might have flourished well, and have yielded plentiful crops of fruit. For the same reason, many different sorts of fruit should not be planted together in the same orchard, as is the practice of some, who mix them alternately : for besides it's being impossible for them all then to have an equally proper earth to grow in, there will be such difference in the size of the trees, as will not only render them unsightly, but also the fruit upon the lower trees, perpetually overshadowed by the higher, will not ripen well, nor, of course, acquire a good flavour. He therefore, who is determined to plant several sorts of fruit on the same spot, though this is by no means advisable, unless it be, perhaps, upon a rich and pretty strong loam (for that is the soil in which the greatest number of different sorts of fruit trees will thrive best), should observe to plant the largest growing trees backward towards the north, and proceed gradually towards the south with those of lesser growth. By this means the whole plantation will have a regular slope, and the sun and air will more easily pass through it, and dispense their benefit to every tree. This, and their standing sufficiently distant from each other, are the surest means of preserving them from the bad effects which would otherwise ensue if the damp vapour of their own perspiration, and the exhalations of the earth mixed therewith, were pent in among them : for these, besides injuring the growth of the trees themselves, are imbibed by the fruit, of which they then render the juices crude and unwholesome, and spoil the taste.

The manner of transplanting fruit trees from the nursery, and of training them for standards,  
and



and consequently to be fit for the orchard, having been already given, together with the time when, and the age at which, it is best to remove them, and also directions for pruning them when grown up<sup>e</sup>; I am now to observe, that the distances at which they are here set should be proportioned to the extent of the most vigorous growth of each particular sort. About sixty feet will be sufficient for the largest, in an inclosed orchard, and about thirty will be enough for the smallest. The quincux order is the best form to set them in.

When the trees are planted, (the orchard being previously well fenced in,) they should be tied up to stakes to prevent their being blown out of the ground, or displaced, by high winds; and if the season should prove dry in the following spring, the expence of watering them may be saved, in a great measure at least, if not wholly, by covering the surface of the earth over their roots with green sods, turned the grass side downward. These will prevent the sun and wind from drying the ground, and will help to enrich it when they are dug in, as they may be gently after the first year; for the trees will then be out of danger, if they have taken well. Till then, and even till they are grown somewhat large, it will be right to give them a yet farther support against the wind, and a defence from cattle, by setting round each of them, triangularly, three pretty tall and strong scantlings of wood, (which are generally sawn out for this purpose, but the thick ends of strong poles may do,) fastened together with two or three cross bars on each side, and drawn pretty close to each other at their top, where the stem of the tree, when it has passed their height, should be

<sup>e</sup> See the preceding *ARTICLES* I, II, III, and VI.



wrapped round with a band of straw, hay, or some other similiar soft substance, to prevent it's being galled by rubbing against them, and to keep it the more steady.

The intermediate spaces between the trees of the orchard thus planted may be sown with grafs, corn, or kitchen vegetables, just as in an open field; so that there will not be any loss of ground. The only cautions to be observed in this case are, not to dig or plow so deep as to tear the roots of the trees, and not to injure their stems with the scythe or sickle. For these reasons, and also that the goodness of the soil may not be too much exhausted in the places where it's fertility is most immediately wanted, none of the additional crops should be sown quite close to the trees, nor should any large rooting plants, especially weeds, be suffered to grow near them. A careful stirring of the surface of the ground about the roots of the trees, will do them great service; and the oftener this is done, the better they will thrive, especially if those spots are at the same time properly manured.

The whole of the soil thus occupied must be mended every second or third year with dung, or some other suitable manure, the expence of which will be amply repaid by it's double produce. And here I must observe, that, as the ground will yield it's usual crops, and those equally good, when it is likewise interspersed with fruit trees planted at sufficient distances, such for example as sixty feet, at least, for apples and pears, both of which will do best in the richest soils; I see no reason why this plantation should be confined to the small compass of what is commonly termed an orchard; nor why the intelligent husbandman should not reap the same advantage from all his fields, whether they be arable, or pasture. They will afford him



him, without much diminution of his other crops, such plenty of all sorts of fruit, for domestic uses, for cyder, for perry, and for sale, as will hardly be the least profitable part of the reward of his industry, but probably, by far the most considerable.

Even the parting fences in the farm are proper places for standard fruit trees. Almost all the Kentish cherries<sup>f</sup>, for example, the produce of which amounts to considerable sums every year, are gathered from trees planted in hedges. Pear trees are raised in the same situation, to the no small advantage of their owners, for perry; and if crabs are planted in the hedge rows, apples may be very properly, and very profitably, grafted on them, especially for cyder. Besides, the wood of the pear tree is valuable, as is also that of several thorny plums, (which are therefore well worth setting in these places), for the fineness of it's grain, it's colour, and the polish it will take: and so is likewise the timber of the black cherry tree, of the bird cherry tree, and of the Mahaleb, or perfumed cherry tree<sup>g</sup>, all of which frequently grow to a size big enough for the use of cabinet makers, even for tables. The wood of the Mahaleb cherry is greatly esteemed by the French, on account of it's agreeable odour, in consequence of which they often pass it off for the sweet scented wood of the island of St. Lucia: but that of the bird cherry is yet better.

To save the expence of fencing each single tree that is planted in the open ground, whether it be field or orchard, with posts and rails, as before directed, and as is the common practice, or with

<sup>f</sup> This is the *Cerasus sativa rotunda rubra et acida* of C. Bauhin, P. 449.

<sup>g</sup> This is the *Cerasus sylvestris amara, mahaleb putata*, of J. Bauhin.



hedges and bushes, which must be renewed every other year; Mr. Evelyn recommends<sup>h</sup>, upon his own experience, the following method, communicated to him by Dr. Beal, as an equally effectual, and much cheaper security against cattle.

Set your tree on the green sward, or five or six inches under it if the soil be very healthy; but if it be moist or weeping, half a foot above it: then cut a trench round the tree, at the distance of two feet or more from it: lay a range of the turfs, with the grass side outward, upon the inner side of the trench towards the tree, and then a second range upon the former, and so to a third and fourth, all regularly placed, and leaning towards the tree, after the form of a pyramid, or large hop-hill. As each circle of sods is thus placed, the interval between it and the tree must be filled up with the loose earth of the second spit that is dug out of the trench. This trench may be two feet and an half wide, or more, according to the intended height of the hillock, for which three feet will hardly be too much in this way of planting. At the top, it's diameter may be about eighteen inches, or two feet, and the earth there may be left in form of a ditch, to convey the rain towards the stem of the tree. Five or six small briars or thorns stuck up around the summit of this, and bound lightly to the body of the plant, will complete this work, from which our author deduces, among some others, the following advantages; *viz.* That, neither swine, sheep, or any other cattle, can annoy the trees thus planted; that when they are thus secured, they may be planted younger than might otherwise be proper in an open field; that they will resist the violence of the wind, when they are fixed in

<sup>h</sup> In his POMONA, c. 7.



these hillocks, without danger of being fretted, and thereby cankered, by stakes to support them; that if the soil be wet, that inconvenience is hereby remedied in some measure; and that, if it be very dry, the hillock is a defence from the outward heat.

By the second or third year the trench (for the space taken up by which the grass upon the bank around the tree will make the farmer amends) will be nearly filled up again by the treading of cattle, if the ground be moist, or the seasons wet. It will then be necessary to renew the fence of thorns; and if a little rich mould is thrown into the bottom of the trench, (for it should not be cleansed, like a ditch,) it will promote the growth of the trees, and invite their roots to spread.— Where the soil is not rich, the cleansing of a frequented high-way, or of a yard where cattle are kept, will be of great service to the trees around the roots of which it is laid in the trench. One load will be sufficient for six or seven trees; and those of apples, in particular, will be singularly benefited thereby.

Greater caution should be used in the pruning of trees in orchards, or planted out in the field, than is necessary for those in gardens; because as the former stand at greater distances, and the plants under them are of less proportionable value, their branches may be permitted to extend wider, according to their natural growth, without restricting them to any particular form. By this means, (only cutting out the dead wood, and such shoots as cross one another,) they will not only be very fruitful, but also very long lived: for, as Mr. Evelyn observes in several parts of his most valuable work, there are few trees, even of the seemingly most perishable kinds, which will not last for ages, if the murdering knife is but prudently



withheld from them: for when that is used so much as to leave considerable parts of their maimed branches, especially near the body, exposed to all the inclemencies of the weather, the wet, which gets in there, often rots them to the very heart.

Some particular counties are famous for particular fruits, as Devonshire for the red-streak apple, Herefordshire for the sweeter sorts, Worcesterhire for the Turgovian and the Bosbury pears, &c. of which farther notice will be taken under the articles of Cyder and Perry. But I cannot help thinking that these distinctions are owing to want of attention in the husbandman: for I see no sort of reason why the red-streak, for example, should not grow in any other county as well as in Devonshire, or why the sweeter Cyders should be peculiar to Herefordshire. A similar soil, and a similar situation, will undoubtedly produce the same fruits in every part of England. Numerous are the instances of plants which have been brought even from the most different climates, and naturalised where they have been cultivated with due care. Thus the cherry tree, now so common all over Europe, was first brought from Asia, by Lucullus, who carried it to Rome, from whence it spread, and reached Britain in the year of Christ 55\*: and it is to equally foreign extractions that we owe most of our good fruits. The very grain which is now the chief support of all

\* Lucullus is said to have carried the cherry tree to Rome from Cerasus, a city of Pontus, which he took, and destroyed, at the time of the Mithridatic victory, in the year of Rome 680. Consequently, supposing this account to be true, (which the testimonies of the ancients leave us no room to doubt,) and that it was then first planted in Italy, it found it's way hither about 120 years after. Whether it derived it's Latin name *Cerasus* from the Greek city Κέρασος, or whether that city took it's name from the great number of cherry trees which grew about it, is quite immaterial to us.



the nations in Europe, was probably a native of the warmest parts of Africa; and, according to Pliny and Columella, lucerne, which now yields such abundant crops in this kingdom, was originally brought into Europe by Xerxes, when he returned from his expedition against the Greeks.

The *Chestnut* tree, highly valuable for it's timber, which is equal to the very best oak in some respects, and superior to it in others, is properly a forest tree, and will accordingly be treated of as such under that head. Where it is cultivated for it's fruit, as in Portugal and Spain, from whence we have the finest, it is raised from the nut planted in February, about four inches deep in fresh undunged earth, and is afterwards grafted and managed like other fruit trees: but this grafting, and the shortening of it's tap root when it is removed from the nursery, which is usually done after it has stood there three or four years, generally spoil it for a timber tree, by making it branch out too much. It's own leaves, if they are suffered to rot upon the ground, and are slightly dug into it in the spring, around the roots, but, as in the dressing of other trees, at some distance from the stem, will be a sufficient manure. 'Tis pity that these leaves make so great a litter as they do: for otherwise the chestnut tree would form delightful avenues, or smaller plantations near a dwelling house.

The *Walnut* tree was formerly held in great esteem in this country, for it's wood, which is, in fact, often very finely veined; but, on account of it's aptness to be worm-eaten it has of late given place to the beautiful and much sounder mahogany, with which our cabinet makers have been pretty-plentifully supplied from the British settlements in the West Indies. As an useful fruit tree, independent of it's timber, which is, however, still  
of



of good value, it merits the husbandman's attention; nor can the gentleman easily find a more stately one to adorn his park with, or to form a noble avenue to his mansion.

These trees are raised from their nuts, which it is best to keep in dry sand, with their outer covers on, till February; that being the right time for planting them. If they are intended for timber trees, in which light they will be farther considered when we come to treat expressly of that subject, they should be sown in the places where they are to remain, in order that the breaking or otherwise shortening of their roots, and especially those of the tap kind, may not stint their growth, and make them run out in branches: but if they are designed for fruit, their fertility will be increased by transplanting them, because their downright roots, which are those that chiefly encourage the luxuriant growth of wood in all sorts of trees, will be thereby checked, and they will be made, in lieu of them, to strike out numbers of lateral roots, which, as experience has proved, always conduce greatly to the production of the largest and fairest fruit. The most proper season for transplanting them is when their leaves begin to decay; and the best age, when they have had three or four years growth in the nursery. Mr. Miller says<sup>i</sup> he has frequently experienced that there is little danger of their succeeding although they be eight or ten years old when they are transplanted: but, however that may be, it is certain that they will root best, grow largest, and last longest, if they are removed young. The less their branches are cut at the time of transplanting, or indeed at any time after, the better they will prosper; for much lopping often causes them to decay: but if there be a

<sup>i</sup> *Gardener's Dict.* Art. JUGLANS.



necessity for taking off any of their boughs, it should be done early in September, that the wound may have time to heal before the cold and wet comes on. It is likewise essential to cut the branch off quite close to the trunk, lest the stump which is left should decay, and rot the body of the tree; to prevent which, especially if the wound be large, it will be right to smooth it well with a chissel, and then to cover it over carefully with a cement of clay or wax, as in the case of grafting, with a piece of tarpawling, or of sheet lead, over that, in the manner before directed.

These trees should not be planted nearer together than forty feet, and more may be yet better, if they are designed for fruit. They delight in a firm, rich, loamy soil, or such as is inclinable to chalk or marl; and they will thrive very well in stony ground, or on chalky hills, as is evident from those large plantations near Leatherhead, Godstone, and Carshalton in Surry, where great numbers of these trees planted upon the downs produce annually large quantities of fruit, to the no small advantage of their owners.

In order to preserve this fruit, it should be left upon the tree till it is thoroughly ripe, and then, as it would be exceedingly troublesome to gather it by hand, it may be beaten off, but not with such violence as is commonly used, from a mistaken notion that the tree is improved thereby: for most certainly it cannot be benefited by that rough way of forcing off the young wood upon which this fruit grows. The nuts thus obtained should be laid in heaps for two or three days, after which they should be spread out, and when they have parted from their husks, which they will then soon do, and have afterwards been well dried in the sun, to remove the moisture of their shells which would otherwise make them mould, they should be laid  
up



up in a dry place, where neither mice nor other vermin can get at them. In this manner they will remain good for four or five months: or, which a yet better way, and will keep them still longer, let them, when their outward moisture has been dried by the sun, be put up in jars, or other close vessels, with dry sand between their interstices. The laying of them for four or five hours in an oven gently heated, as is the practice of some, will indeed dry the germ, and prevent their sprouting: but if the oven is too hot, it will make the kernels shrink, and prevent their being peeled with any tolerable ease.

Were it only for the oil that these nuts afford, the trees which produce them would be worth some care. Mr. Evelyn says<sup>k</sup> that one bushel of them will yield fifteen pounds of peeled kernels, and that these will yield half that weight of oil, which the sooner it is drawn, is the more in quantity, though the drier the nut, the better in quality. He adds, that the lee, or marc of the pressing, is excellent to fatten hogs with. — Certainly it would be good manure for land; as are the cakes of lin seed, rape, &c. after the oil has been squeezed out of them. The green husks boiled, without any mixture, make a good colour to dye a dark yellow. The kernel being rubbed upon any crack or chink of a leaking vessel, stops it better than either clay, pitch, or wax.

The French are very fond of the kernels of these nuts scooped out of the shells before they are hardened, with a short broad brass knife; because iron rusts. When scooped out, they are steeped in salt and water for a few hours before they are set upon the table, as well to take off all taste of bitterness, as to make them peel with the utmost

<sup>k</sup> *Discourse of Forest Trees*, c. 8. §. 4.



ease. They call them *cerneaux*: and think them much whollomer and more palatable when so prepared, than when eaten older, harder, and drier.

Though the fruit of the *Service* tree is not much esteemed in England, it is often served up to the table, as a part of the desert, in the South of France, and in Italy, where there is no want of a variety of fine fruits. The species there is indeed much larger than ours<sup>1</sup>: but as Mr. Evelyn<sup>m</sup> has left us no room to doubt that our wilder sort, which grows naturally in many parts of England, may, like all other plants, be greatly improved by due culture, it is well worth the husbandman's while to give it a place in his orchard, or other ground. Mr. Miller too gives more than one instance of his having seen the service tree brought to great perfection in this country<sup>n</sup>. He has observed three sorts (Mr. Evelyn noted four) of our native growth, the fruit of one of which is shaped like a pear, and that of the other like an apple. The former, which resembles most the foreign species abovementioned, is the best and the largest grower; for it will sometimes attain to the height of near forty feet.

It is a common, but a very mistaken saying, that the sower of these trees never sees the fruit of his labour. This notion may have arisen from their bearing most plentifully when they are very old: but, with proper care, they may be made to produce fruit in a few years, even from the time

<sup>1</sup> The former is C. Bauhin's *Sorbus sativa*, cultivated Service, P. 451; and our's is the *Sorbus sylvestris*, *foliis domesticæ similis*, Wild Service, with leaves like the cultivated, of the same author, P. 415. This last is commonly called here Quicken, Quickbeam, mountain Ash, and in the North, Roan tree.

<sup>m</sup> *Discourse of Forest trees*, c. 10. §. 1.

<sup>n</sup> *Gardener's Dict.* Art. SORBUS.



of raising them from their seeds; and if they are propagated by layers, or cuttings, they will soon begin to repay the pains bestowed on them.

To propagate them from their seeds, of which there are three in each berry, or chequer, as some call this fruit, the pulp should be rubbed off clean, with dry sand, soon after the fruit is ripe, and the seeds, which are of a hard strong nature, should then, according to Mr. Miller's directions<sup>o</sup>, be sown in pots, for the convenience of plunging these into a moderate hot bed in the spring, in order to forward their growth: for it will be sufficient to shelter them under a common frame during the intermediate winter. When the plants are come up, they should be kept clear from weeds, watered in dry weather, and exposed to the open air: for a close hot bed would then draw them up so weak as to spoil them; nor indeed is any thing more intended here by this method of raising them, than to make the seeds sprout sooner than they would do in the common open ground, which, that circumstance excepted, will do equally well, as these plants are very far from being tender. About the middle of October, at which time their leaves will decay, they should be taken out of the pots in the hot bed, and planted in the nursery, in rows two feet asunder, and a foot apart in the rows. A little mulch should be laid upon the surface of the ground, over their roots, in the winter, to protect them from being injured by frost before they have well taken root, and in the next spring the ground between them should be dug, and the mulch buried therein, with care not to cut or injure their tender roots. With this management, and keeping them constantly clear from weeds, they will be fit in three

<sup>o</sup> *Gardener's Dict.* Art. SORBUS.



or four years, according to their growth, to be transplanted into the places where they are to remain: but previous to this it will certainly be right to graft them, as Mr. Evelyn advises <sup>p</sup>, for the greater improvement of their fruit. They take well either on their own species, or on the white thorn, the quince, or the medlar. The best season for removing them from the nursery is in October, or in the spring just before they begin to shoot, and the soil in which they thrive best, soonest produce fruit, and last the longest, is a moist strong ground, defended from cold wind. However, they will grow even in the most exposed places, and thrive where few other trees will succeed; for they are extremely hardy. This renders them well worthy of the husbandman's attention, as well for their timber (which will be spoken of hereafter) as for their fruit. This last makes a pretty appearance when ripe; but the black birds and thrushes are so fond of it, that they devour all they can come at. A way, therefore, to draw these warbling songsters about an habitation, is to plant a quantity of these trees for that purpose. Like the medlar, this fruit must be kept till it is almost rotten, before it will be fit to eat.

<sup>p</sup> *Ubi supra.*



## S E C T. IV.

## OF THE DISTEMPERS OF FRUIT TREES.

**F**RUIT trees are, like all other vegetables, subject to various distempers and casualties, which affect their several parts, and destroy them, if they are not carefully prevented, or remedied in time. The chief causes of them are, too great luxuriance of growth, too much poverty, injudicious cutting, blights, insects and other vermin; for as to the necessity of keeping them clear from weeds, especially while they are young, that essential part of all husbandry has already been so often and so strongly inculcated, that there can no be occasion to particularise it here.

To the means before directed for checking by proper pruning, that excess of vigour which makes a tree spend itself in wood, instead of producing fruit; I shall only add here, that the boring of a hole through the body of the tree has frequently been practised with good success for this purpose; and so has the splitting of their roots, and putting a wedge or stone into the cleft. Either of these methods, which Mr. Worlidge mentions<sup>p</sup>, will undoubtedly help to prevent a too exuberant rise of the sap.

Digging, plowing, or otherwise stirring and loosening of the earth about the roots of fruit trees, but with caution not to break or tear those roots too much, adds greatly to the fertility of the trees, for which it cannot well be too often repeated. It was upon the same principle, which is

<sup>p</sup> *Systema Agriculturæ*, c. 7. §. II.



the fundamental one of the new husbandry, that the best cultivators among the ancient Romans were fond of practising, and have strongly recommended, particularly for the Vine, in treating of which it will be farther noticed, what they call *ablaqueation*, that is, laying bare their roots just before the winter comes on, and leaving them exposed to the air during that season, with the earth thrown up all around, like a kind of dish, to receive the rain. This has been done in England with great success, for fruit trees which neither throve nor bore well; and the most proper time for uncovering of the roots here has been found to be about the beginning of November: When the mould is returned back into the hole, as it must be at the approach of spring, besides it's having been then mellowed and improved by the influences of the winter, it should be mixed with such manures or other corrective as is best suited to the nature of the tree and of the soil.

It is chiefly, if not wholly, owing to the want of due culture of the ground about the roots of trees, that we see so many of them over-run with moss, to their very great injury, especially when they begin to be old. Mosses are perfect plants, the roots of which, when they grow upon trees, pierce through the bark, and draw their nourishment from that at first soft mucilagenous substance under the bark, which afterwards becomes wood. By this means the increase of the tree is prevented in that part, so that it becomes of an unequal size; and probably the juices in general may be vitiated. Whether this is the case, or whether the seed of the moss takes root only on distempered trees, is not well ascertained. The latter seems the most probable; because the bark of healthy trees is so firm, and generally so smooth, that it will not afford lodgement to the seed. But however that



may be; when moss is actually settled upon a tree, the husbandman must endeavour to get rid of it. To this end, when he prunes his trees, and does whatever else is necessary about them, in the winter, he should most carefully scrape and rub off every vestige of moss, even from such trees as are already so far decayed as not to merit any attention on their account, in order to prevent the seed's being carried to other trees; for it is so extremely small, that the least breath of air will waft it about. For this reason too, all the moss that has been scraped off should be carried away, or burnt, as Mr. Miller advises, that none of it's seed may be left. He also, very rightly, enjoins thorough and frequent stirring of the ground about the trees, not only as the most effectual way to guard against the growth of moss, but likewise as the only one by which, together with lopping off some of the branches in order to invigorate the rest, it's return can be prevented<sup>q</sup>. A forcing pump will beat great part of the moss off from the upper parts of a high tree, by the violence with which it protrudes the water; and the remainder will yield the more easily to the scraper and rubber after it has been soaked with wet. If the scraper is somewhat curved, it will the better encompass the branches of the tree; and if it is of hard wood, it will be less apt to injure the bark of the tree, than if it were of iron. The rubber must be a piece of coarse linnen, or hair cloth. Where the quantity of moss is but small, for the prudent manager will not ever suffer it to spread, it may be scraped or rubbed off, after a shower of rain. — Mr. Mortimer says<sup>r</sup> he knew a person who had an apple tree very much over-run with moss,

<sup>q</sup> *Gardener's Dict.* Art. Muscus.

<sup>r</sup> *Art of Husbandry*, Vol. II. p. 315.



and that he cured it by making around it a stye in which he fatted hogs.

The same author instances<sup>s</sup>, as a farther proof of the efficacy of swine's dung when it is used for manuring of fruit trees, a gentleman near Hereford, who fed several hogs about some old apple trees which he thought had done bearing, and had the next year thirty bushels of apples, apiece, off from many of them. From hence he is induced to think that a moveable stye, made with hurdles, and removed from one tree to another as occasion may require, will be a very great improvement of all sorts of fruit trees, not only to promote their bearing, but likewise to cure them of the moss, canker and other infirmities; especially as this way will save the urine, which he prefers for trees much before dung, because it penetrates better to the roots, and is perhaps a yet more effectual cure for the abovementioned distempers.

That urine is a very beneficial manure for fruit trees, as well as for other vegetables, and that it may be successfully applied, in moderate quantities, to the body and branches of the tree, to cure cankers, and kill moss and worms, is confirmed by Mr. Hartlib, Sir Hugh Plat, Dr. Plot, and others: but it does best when so stale as to have lost it's fiery particles; and for the same reason dung should not be applied to fruit trees before it is thoroughly rotten and has entirely lost it's heat. The best season for using the urine, to wash the distempered trees with, is in March, in the course of which month the operation should be repeated at least two or three times.

The canker in fruit trees is most commonly occasioned by wet, which gets in at the cleft where the tree was grafted, or at some other

<sup>s</sup> *Art of Husbandry, Vol. II. p. 319.*



wound which has been neglected: but it also proceeds sometimes from the soil's not agreeing with the nature of the tree.

If this distemper be only superficial, arising from a bruise, for example, which the bark may have received, it may be cured by cutting the injured part out with a sharp knife, and then binding over it a mixture of cow dung and earth, tied on with a wisp of hay likewise daubed with cow dung. This must be done before the sap begins to rise: for otherwise the bark will peel, loosen, and wither much farther than the bruise, to the great hazard of the whole tree, especially if the stem be the part affected<sup>t</sup>; for as to a bruised branch, the best way is to lop it off at once, if there be the least suspicion of danger. But when the canker has been bred in the tree, or when it has extended from the trunk to the branches, or from the branches to the trunk, so that after cutting away to the very quick there still remains an eye, or speck (like that which is sometimes seen to run through a whole plant of distempered corn), the shortest way is, to commit the tree to the fire, and to plant another in it's stead. Mr. Nourse is indeed inclined to think that<sup>u</sup>, if the canker has not penetrated too far, the tree or stock, supposing it to be of the apple kind, may possibly be saved, by regrafting it with a winter Quinnin, a Boderan crab, a Boon apple, or a golden pippen; neither of which he had observed ever to canker: but how accurate his observations may have been in that respect, I shall not pretend to determine. Certainly it may be worth while to try a change of fruit in all such cases, if they are not absolutely desperate. He asserts, upon his own experience<sup>x</sup>,

<sup>t</sup> NOURSE's *Discourse of the Benefits and Improvements of Husbandry*, p. 138.

<sup>u</sup> *Ibid.* p. 139.

<sup>x</sup> *Ibid.*



that the apple which we call a Woodcock, is no way apt to canker, or to be blasted. This, if it be fact, renders it by so much the more worthy of cultivation, as it is a great and constant bearer, and yields an excellent juice. The misfortune is here, as well as in the attempts which have been made to suit the soil and the fruit, that each of these is distinguished, either by such general appellations and descriptions as serve only to puzzle the husbandman when he comes to real practice, or by names which are not known out of the places where they are used. Dr. Cullen will render a great service to mankind, if he should happily succeed in that important point, which, if I am rightly informed, is the object of his present studies; *viz.* to ascertain by an exact analysis, which no one can be better qualified to do with the utmost precision, what are the component particles of each different species of soil, and in what proportion they are to each other. This, divested of that parade of science, and of scientific terms, which the learned are too apt to display, and which serves only to embarrass common understandings, will (should such a work appear, as it is hoped that it will soon,) answer a very essential purpose in agriculture, as well as lay a fine foundation for useful entertainment to gentlemen whose leisure permits them to prosecute such studies. But the task, considered in all its various branches, is arduous indeed! worthy of that able physician (I use the word here in its most extensive and most proper meaning) and skilful chemist, whose love for the welfare of mankind has prompted him to undertake it.

Mr. Worlidge assures us <sup>y</sup>, that he himself cured a tree desperately diseased with the canker, by cutting off as many as he could of the cankerous

<sup>y</sup> *Systema Agriculturæ*, c. 7. §. 11.



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boughs, laying it's roots bare during all the winter, and applying to them in the spring a great quantity of swines dung (not too new) mixed with the earth which was then returned into it's former hole. If this does not do, he condemns the tree to be grubbed up, as being past recovery.

The remedy for a tree which is bark-bound, and therefore does not thrive well, is, to slit it's bark, with a knife, down the body of the tree, in April or May <sup>z</sup>.

Some trees are hurt by small worms which breed between the bark and the wood, and make the bark swell. Mr. Worlidge destroys them, by cutting away part of the bark, and washing the tree with urine and cow dung <sup>a</sup>.

The heavens are often blamed for blights which are caused by the husbandman's own neglect: for were he but sufficiently attentive to clear his trees of every vestige of caterpillars, and of their nests of former years; the winds, so unjustly accused, would be found to be that beneficent ventilator which the bountiful Author of Nature intended they should be. They only favour the vivifying of those eggs which remain from the preceding year. No care should therefore be spared to clear the trees of all caterpillars the moment they appear, and to destroy their eggs with all possible diligence: for, as we have seen most remarkably in the moth which desolates the province of Angoumois <sup>b</sup>, all these insects multiply with astonishing rapidity. The labour, great at first, will decrease yearly under the hands of an attentive husbandman, who will pluck off all their webs, or nests, as soon as he perceives them, then burn those nests, with the eggs in them, and cleanse thoroughly the parts of the tree where they were, by washing them with a

<sup>z</sup> *Id. ibid.*

<sup>a</sup> *Ibid.*

<sup>b</sup> See *Vol. III. p. 45. et seqq.*



strong lye, and rubbing them well with a hard brush, as before advised<sup>c</sup>: for the common method of burning straw, or brimstone, under them, is not near so effectual as this.

When caterpillars lay their eggs on the leaves of trees, as they often do in very great numbers, they pierce the outer skin of the leaf, and then deposit under it their eggs, which are from that time fed by the juices that should circulate to promote the vegetation of the plant: so that they then become doubly destructive. M. de Réaumur has treated this interesting subject in so masterly a manner, that I am sorry the bounds of this work permit me only to refer the curious reader to his most accurate and ingenious account of Insects.

It is a most excellent contrivance which Mr. Bradley mentions<sup>d</sup> his having learnt from a gentleman of Hertfordshire, to defend fruit trees from the ravages of snails, slugs, caterpillars, and all other creeping vermin. After observing, that the laying of tobacco-dust, foot, saw-dust, barley, chaff, &c. about the stems of the plants, affords but a very short protection, for the first shower of rain demolishes it, and that tar put upon them is dried up by a few warm days; he directs, to wrap about the stem of a tree two or three rounds of such line or rope, made of horse-hair, as is commonly used to hang cloths upon; for this is so full of stubs and straggling points of the hair, that none of these slow crawling creatures can pass over it, without wounding themselves to death. The head of a standard can therefore receive no harm from them, if the bottom of it's stem is thus secured: but the sheltering of a wall tree requires a little more caution; for besides preventing their passage

<sup>c</sup> *Ibid.* p. 91.

<sup>d</sup> *Gentleman's and Gardener's Kalendar*, Art. APRIL.



up the stem, one of these ropes must be fastened close to the wall, so as to inclose all the branches of the tree, and allow space enough to nail up the summer shoots within the compass of the hair line, which may easily be so disposed, by giving it a couple of turns round the space occupied by the tree, as to be enlarged to whatever breadth may be requisite. The same rope will last several years. — In espaliers of fruit trees, it is only necessary to wrap these hair lines round the stems of the trees, near the roots, and about the bottom of every stake. This work should be done in the winter, when the snails are laid up in their close quarters. — The same means may be used to defend all sorts of garden plants, by fastening the hair lines around the edges of the beds in which they are to grow. The best lines for this purpose are those that are made of the shortest hair; for they are fullest of points, and therefore most completely armed against any attempts of these pernicious vermin.

A very hurtful blight frequently arises in the spring from cold winds and frosts, which, especially if they come on suddenly after the weather has been somewhat warm, stop the circulation in the tender buds, and thereby kill them. The only method yet discovered in some measure to shelter wall-trees from this mischief, for I see not how it can be so easily applied to others, is, to cover the walls carefully with mats, canvas, reeds, or any such like defence, which, being fastened so as not to be disturbed by the wind, will afford good shelter during the night, and, if the weather permits, may be removed in the day, as indeed it should be, in order to avoid rendering the young shoots and leaves too tender to bear the open air, when they are afterwards exposed to it; for that would be the case, if they were to be kept covered  
in



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in this manner for any length of time. If these coverings are fixed near the upper part of the wall, and are fastened to pullies, so as to be drawn up, or let down, they will be managed with very little trouble.

These screens may likewise answer another purpose, of a quite different nature from the foregoing, *viz.* to prevent the too early blossoming of the finer fruits. by covering the trees with them in the day time, when the warmth of the sun might perhaps swell their buds too soon in the season, and taking them off at night, to give a farther check to the rising sap. By this means the danger of their too early blossoming, which is the great thing to be feared, will, in some measure, be obviated.

As to that excessively pernicious blight which is called a fire-blast, and on the cause of which Mr. Miller reasons <sup>e</sup> so very profoundly as, I must confess, greatly to surpass my understanding; I shall only observe, with him, that it sometimes happens very late in the spring, and even in the month of May; and that it has often destroyed the fruit, leaves, and parts of trees, and sometimes even whole trees, in a few hours, in large orchards and open plantations, as well as, in gardens, and against walls; nor have any means of guarding against it yet been found. — Columella tells us, indeed, that his uncle, who was a most diligent farmer in Bœtica, used to cover his vines with mats in the beginning of the dog-days; because, during that season, the country was subject to a scorching easterly wind, which, like a fiery vapour, burnt up the grapes if they were not covered. But it can hardly be practicable to apply any shelter of this kind, or of any other that is proper, to

<sup>e</sup> *Gardener's Dict.* Art. BLIGHTS.



tall and spacious standard trees planted at considerable distances from each other.

The want of rain just at blossoming time often occasions the dropping off the blossoms, for want of sap to nourish them, especially in dry grounds: upon which Mr. Mortimer observes <sup>f</sup>, that he had heard of some persons in Essex, whose orchards were upon a dry soil, who, only by keeping their trees watered at that season, had great quantities of fruit when the crops of all their neighbours failed: and of a gentleman whose orchard, situated on a sloping ground which he had the convenience of watering when he pleased, hardly ever failed to yield great plenty of fruit. In such drougthy seasons, it will likewise be advisable to water the tops of the trees with a forcing pump; for this will not only refresh the leaves and blossoms, but also wash off the eggs of insects, which are generally deposited on them in vast numbers in that sort of weather.

Sir Hugh Plat says, that green cow dung and urine mixed together, and rubbed about the stems of trees, with a brush, once in two or three months, will prevent rabbits, hares, deer, &c. from gnawing off their bark: and Mr. Evelyn recommends <sup>g</sup> for the same purpose, human dung mixed with a little water, or urine, and lightly brushed on (but this must be renewed after every great rain); or, which may be somewhat cleaner for the person that uses it, and which rabbits and all cattle most abhor, to water or sprinkle them with the liquor in which tanners have dressed their hides; or, to tie thumb-bands of hay or straw round them as far as those creatures can reach.

<sup>f</sup> *Art of Husbandry, Vol. II. p. 313.*

<sup>g</sup> *Discourse of Forests Trees, c. 27.*



As a preservative against all small vermin, such as ants, pismires, &c. which often do very great mischief to trees, the authors of the *Maison rustique* advise<sup>h</sup> to lay a little heap of haulm, straw, or any kind of mulch, round the bottom of the tree at the beginning of winter, and to take it away and burn it early in the spring; by which means vast numbers of those insects, sheltered there during the hard weather, will be destroyed with it.

No sort of manure that is used for a tree should ever be laid near to the stem, but always at a distance from it proportioned to the spreading of the roots, according to the age and long standing of the tree.

When an orchard or other plantation is grown so old and decayed as to be no longer worth keeping up (though it will be a great while before that happens, if proper care be but taken of it), the best way is to plant the new trees in the intermediate spaces between the old ones, after preparing the ground as before directed; for they will not do so well if they are set in the very spots where the old ones grew.

## S E C T. V.

## OF THE CULTURE OF THE VINE.

**I**T cannot be doubted but that the Romans, who brought agriculture to great perfection in this country, would at the same time introduce here the cultivation of Vineyards, which had long been an object of their greatest attention in Italy, and which, as we find by their writers on husban-

<sup>h</sup> Tom. II. Part. 3. Liv. 6. c. 1.



dry, they had extended no the other northern provinces of their empire. They kept possession of this island till the Christian religion was established in it, and till the formation of religious communities, who, tempted by the deliciousness of the fruit, and by the amusement which it afforded to men separated from the busy world, would undoubtedly preserve the culture of the Vine; and this, in all probability, remained in their hands only, for some ages after, during the unsettled state of the kingdom. The military spirit which so peculiarly distinguished this nation after the Norman conquest, continued the practice of the common farming in the hands of the meanest of the people, who, during the feudal tenures, being hardly better than slaves, could have but little power, and yet less inclination, to attempt the raising of vineyards, which are necessarily attended with a considerable expence at first, and afford but a distant prospect of profit. The religious houses therefore still retained to themselves the more costly culture of the Vine; and with them it fell, at their dissolution by king Henry the eighth: nor was it revived, till the more elegant taste in gardening was introduced at the restoration; and then only as of a plant fit to add to the pleasure of fruit gardens. This accounts for the quantity of lands which appear by antient records to have been allotted to the abbeys and monasteries of this kingdom, for their vineyards.

It may perhaps be a question, whether Vineyards can be brought to such perfection, as to answer the expence necessarily attending them, in England, where the soil and climate are highly favourable to the production of corn, and rearing of cattle. These, not only yield plenty of food and rayment for our own use, but, which we cannot



not ever expect from the vine, they also afford us the most considerable articles of our commerce with other nations.

Whatever may be the fate of Vineyards in England, they may certainly be brought to perfection in our colonies; for the use of which I shall therefore make my account of the culture of the Vine as general as I can, the better to suit it to the several climates of North America.

Columella asks his friend Publius Silvinus, "Who had written so fully and so accurately of the Vine before him?" and we may, with equal justice, ask, Who has excelled him since? I shall therefore make him my chief guide in treating of this subject; and believe that his excellent instructions, together with the principal improvements of the moderns, which I shall endeavour to point out, as I shall also the circumstances wherein, and the reasons why, Mr. Miller differs from him, will be sufficient to direct the intelligent husbandman how to manage his vines.

## A R T I C L E I.

### *Of the Situation and Soil proper for a Vineyard.*

THE Vine, says Columella<sup>a</sup>, is, with good reason preferred to all other shrubs, not only for the sweetness of its fruit, but also for the ease with which it answers the labour bestowed upon it, almost in every country and every latitude in the world, except in the frozen or the torrid zones. It grows as happily in plains as upon hills, and thrives as well in a strong soil, as in that which is loose and open; also in land that is poor, as in that which is rich; and in a dry soil, as well as in that which is naturally moist. It

<sup>a</sup> *De re rustica, Lib. III. c. 1.*



alone best endures the intemperature of heat, cold, or stormy weather.

Nevertheless, it is of great importance that the quality of the vine be adapted to the condition of the country : for neither is the culture the same in every soil and climate, nor are all vines of the same kind. It is not easy to say which is the best ; experience teaching us, that every country has it's own, which is more or less proper for it. A judicious husbandman will however easily find, that that vine is proper for the plain, which bears fogs and hoar-frost without being hurt ; and for a hill, that which can bear drought and wind. He will plant in a rich and fertile soil, a slender vine, which does not bear plenty of fruit ; in a stiff soil, one that makes strong shoots and is covered with plenty of leaves ; and in a loose soil, one that makes but few shoots. He will find, that it is not proper to commit to a moist place a vine which bears tender and large grapes ; nor to a dry place, a vine of a contrary quality.

The good husbandman will also know, that the nature of the climate is of great consequence ; whether it be hot or cold, wet or dry, subject to hail and wind, or calm, clear, or cloudy. Two sorts of vines are fit for a cold and cloudy situation, *viz.* either one which is early, and ripens it's fruit before the winter ; or one of firm and hard grapes, which bloom in the midst of fogs, and afterwards mellow with the cold and hoar-frost, as other grapes do with warmth. Where wind and storms are frequent, the vines must take deep root and have hard grapes : where the situation is warm, they may be of more tender and more fruitful kinds. Vines whose grapes rot with rain and constant dews should be planted in dry places ; and those in moist, which are hurt by drought. If any vines are planted in places subject to hail,  
it



it should be those which have large and strong leaves ; because they will shelter the fruit. Where the sky is usually serene and fair, all sorts of vines will grow : and those may be planted to advantage, whose grapes fall quickly off.

Could we have the quality of the soil, the situation of the place, and the state of the weather to our wishes ; that soil should be preferred, which is neither too strong nor too loose, but rather inclining to loose ; neither poor, nor exceeding rich, but rather fertile. The situation should neither be a plain, nor steep, but yet on a rising ground : it should neither be wet nor dry, yet moderately moistened with dews : it should neither have springs on the surface, nor at some depth in the earth ; and yet it should communicate to the vines a moisture which is neither bitter nor salt ; for either of these will vitiate the taste of the wine, and give a scurvy rough coat to every plant that grows on such land. The state of the moisture may be known, by dissolving some of the earth in water. The vine does not prosper either in a frozen, or in a scorching hot climate ; but it thrives best in a country that is rather warm than cold. It is hurt more by rain, than by dry weather, and prospers better in a dry climate, than where rains are frequent. It delights in gentle and moderate gales, but is greatly damaged by storms.

It is an observation of long standing, that ground which has never been plowed, or had trees growing on it, is the best for a vineyard. All authors agree, that an old vineyard is the worst of any for making a new plantation ; because the earth is entangled with the old roots of the vines matted together, poisoned by their decay, and quite exhausted by their long standing. Wood-lands may be used, because the roots of common trees and shrubs are easily extirpated. Where there is no un-plowed  
land



land, the next best is a corn field, free from trees, or where trees have not been planted thick.

The fitness of new ground for the vine may be judged of by the shoots of such shrubs as grow naturally in it: for if they make thriving shoots, which have not a ragged or stunted appearance, the vine will flourish there. Of all soils, a black rich mould is the best for vines. Stones which crumble, or rot as it were, with the weather, being broken, and laid to the roots of the vines, retain a moisture, cool them, and, by that means, are exceeding fit for nourishing them. For the same reason gravel, pebbles, and loose stones are approved of, provided they be mixed with rich mould\*: but if they are mixed with poor earth, they are bad. Flints are likewise very friendly to vines, if covered with a moderate depth of earth; because, being cold, they retain the moisture, and prevent the roots being parched up in the dog-days. The foot of mountains, which receive the earth washed down from their tops; or vallies, to which additions are made by the settling of rivers, which overflow them, are very proper for vineyards. A chalky bottom is fit for the vine; but clay, not excepting even that which approaches to marle or potter's clay, is very unfit; as is also coarse hungry sand. On mountains and rising grounds, and on the sides of hills, vines do not easily take firm root; but they yield wine of a lasting and excellent flavour. In moist and level places, vineyards are exceeding strong; but they

\* Such is the soil of most of the vineyards of Beaune, Chablis, Tonnerre, Auxerre, Coulanges, and Champagne, according to the authors of the *Maison rustique*, (Tom. II. Part. 3, Liv. 6. c. 1.) whose directions for the culture of vineyards, taken from the actual practice of Orleans, Champagne, and Burgundy, which are the three provinces of France most famous for their wines (for the French do not esteem their Bourdeaux wines so much as we do) agree, in all essentials, with those of Columella.  
produce



produce wine of a weak flat taste, which does not keep long.

It may be established as a general rule, to plant vineyards in cold countries so as to face the south, and in warm countries facing the east, unless they are subject to storms from that quarter, in which case it is better that they face the north. In exceeding hot countries, such for example as Egypt, it will be best to expose them to the north.

Mr. Miller says<sup>b</sup>, that the best soil for a vineyard, in England, is that whose surface is a rich sandy loam, and not above a foot and an half, or two feet deep, lying upon gravel or chalk; either of which bottoms is equally good for vines. If the soil is deep, or the bottom either a clay or strong loam, it is by no means proper for this purpose: for though the vines may shoot vigorously, and produce a great quantity of grapes; yet we have not fun to ripen them sufficiently. If the soil is too deep, the roots of the vine will run to too great a depth to receive the influences of the sun and air; whence the juices of their fruit will be crude.

According to him, our vineyards should be planted on the north side of a river, upon an elevation inclined to the south, with a very gradual descent, that the superfluous moisture may be the better drained off. Yet if the ground slopes too much, it is by no means proper for this purpose. Hills to the north, as they shelter the vineyard from cold, and reflect the heat, will be of great advantage. The country round about should be open and hilly, to preserve the air dry. The vineyard should be open to the east, that it may enjoy the morning sun, to dry up the superfluous moisture.

<sup>b</sup> *Gardener's Dict.* Art. VITIS.



Dr. Beal, in N<sup>o</sup>. 116 of the Philosophical Transactions, after having mentioned some instances of the warmth arising from stones under ground, especially lime-stone, and some kinds of pebbles, is of opinion, that, as I observed before <sup>c</sup> (quoting this very passage more at large), many of our hills and rocks might be greatly improved: for it would be no hard task, says he, to shovel down the shallow and mossy turf from the steepest declivities, into places, where it may have some receptable or stay; and there to impregnate it, with the spade and compost, for garden or vineyard.

## ARTICLE II.

### *Of preparing the ground for a Vineyard.*

**T**HE ground must first of all be cleared of the roots of trees or shrubs, or whatever else can be a hinderance to the diggers, or might afterward press down the trenched earth, by it's weight, or by the treading of those employed in carrying it off. It is of great importance that the earth be kept extremely loose, even, if possible, without a foot touching it, in order that the mould, being all equally stirred, may easily give way to the young tender roots, wherever they extend themselves, and instead of obstructing them by it's hardness, receive them into it's tender nourishing bosom, which, in that state readily admits the showers and other influences from above, and dispenses them equally to all parts, for the nourishment of the young plants.

<sup>c</sup> Page 7.



A plain or valley must be trenched two feet and an half deep, and a rising ground three. A steeper hill must be trenched four feet deep: for when the mould is turned down from a higher place, it can hardly be thrown up again to a sufficient depth, unless the trenches are made deeper. Besides, I never approve, says Columella<sup>d</sup>, of planting a vine less than two feet deep, even in a valley; for it is better not to plant it all, than to leave it's roots too near the surface, suspended from the nourishing moisture which lies low, except where springs rise near the surface: there indeed the ground must not be trenched above a foot and an half deep.

The trenches must be made equally deep all the way to the bottom, the sides being perpendicular, and the ground marked out by a line, which must be carried forward as the work proceeds, always at equal distances, till the whole ground is equally trenched. Where the bottom is of a binding nature, it is of great advantage to lay in the bottom of the trenches, small stones, or other rubbish, to carry off the water, which otherwise, stagnating there, would chill the tender roots. In order to do this the more effectually, the bottom of the trenches are made somewhat convex towards the middle, the better to convey the water to drains cut at the extremities of the vineyard.

If necessity forces to replant an old vineyard, all remains of the old vines must be extirpated. The ground ought then to be dunged, with old dung, if it can be had, if not with new, and trenched most carefully, picking out every remaining root, which should be collected and burnt. The trenched earth should then be covered with old dung, which does not breed weeds, or with fresh earth

<sup>d</sup> *Lib. VI. c. 13.*



brought from among thickets. Columella advises particularly, to have a careful overseer to inspect the work-men, and to be watchful that they do not make baulks.

Mr. Miller, instead of trenching the ground as the ancients did, proposes giving it a summer fallow, plowing it as deep as the soil will admit of, and clearing it of roots, weeds, or whatever else can obstruct the growth of the plants.

### ARTICLE III.

#### *Of the choice of cuttings of Vines.*

**C**OLUMELLA advises great care to be taken in the choice of the vine from which the cuttings are taken, and is therefore against purchasing strange plants at a venture, which may come from a soil and climate different from that they are intended for, and may not be of the sort of vine which is desired. A vine cannot be said to be fruitful, because it bears many grapes; for this may arise from the largeness of the trunk, and the great number of bearing shoots, which may have but a single bunch on each. If several bunches of grapes are seen to hang from each shoot; if from each bud left the former year, shoots with fruit spring forth; if the shoots which spring out of the trunk of the vine have some bunches; and if even the secondary shoots, or those which grow out of the present year's shoots, bear grapes; that vine may undoubtedly be esteemed fruitful, and fit to afford cuttings. Whoever has this much at heart, will mark the vines which have been the most fruitful, and have yielded the ripest and soundest grapes, with ochre and vinegar, that it may not be washed off by the rain. Nor is this to be done  
for



for one year only; but the vines ought to be examined for three or more vintages, to know whether they preserve the same degree of fruitfulness: for then it will be certain, that the fruitfulness must be owing to the good quality of the vine, and not to a favourable season. Whatever grapes come to their full maturity without being rotted or damaged, for several seasons running, will yield more, and higher flavoured wine, than any others.

It is not enough that the stock from which the cuttings are taken be fruitful, but they must also be taken from those parts of it which promise the greatest fruitfulness. Those which grow from the stem or old wood of the vine, seldom bear fruit, or produce fruitful vines. Those which grow from the summit of the vine are reckoned too luxuriant to plant; and though the number of clusters on them may promise fruitfulness, yet they should not be relied on; but rather those which grow out of the middle of the vine, of which the wood is firmer than that of the former. This Columella calls<sup>e</sup> the genital part of the vine; and says, that, having followed reason as his guide, and also a long experience, he chooses from that fruitful part of the vine, shoots which, bearing plenty of fruit already, promise fecundity for the time to come. He is not contented with single clusters, but chiefly approves of those which have the most numerous offspring; and adds, that the neglect of these rules has rendered many vineyards less fruitful, indeed some quite barren, when the cuttings have been very improperly chosen.

Some are of opinion, that the whole shoot, as it is taken from the stem, is fit for planting; and for that end, they cut it into pieces of five or six

<sup>e</sup> *Lib. VI. c. 10.*



eyes, each of which they plant. Others, with more reason, think that no part of the shoot is fit for being formed into a cutting, but only that part of it which is next to the wood of the former year: for every bearing shoot abounds in fruit below the fifth or sixth eye. The rest, either bears no fruit, or produces only slender twigs. The ancients, says Columella <sup>f</sup>, always preserved some of the old wood to the cuttings: but experience has shewn that this is wrong; for whatever is left of the old wood soon roots, when it is moistened and covered with earth, and kills the tender roots next to it; and when this happens, the whole vine shrivels, or is burnt up. Whatever remains of the old wood should therefore be cut off, where the shoot grows to it, that the shoot may be planted with it's own small head. — Mr. Miller differs here in opinion from Columella; for he directs, that the shoots should be cut from the old vine, just below the place where they were produced, taking a knot, or piece of the two years old wood to each, which, says he, should be pruned smooth.

Were cuttings, thus chosen, taken from the vines every time they are pruned, for several vintages, and carefully planted, vineyards might be raised, which would yield plenty of the most generous wines: nor need we grudge this delay; for when once we are assured of the fruitfulness of a vine, it may be multiplied by engrafting. This, says Columella, you, Publius Silvinus, can witness: for, from one early vine on your estate, I engrafted the stocks of two *jugera* of vineyard in two years. How much therefore, may the vine be multiplied from these two *jugera*, seeing that these are the offspring of only one?

<sup>f</sup> Lib. IV. c. 17.



## ARTICLE IV.

*Of the Nursery for rearing Vines.*

**T**HERE are two ways of planting vineyards; viz. either with cuttings, or with vines which have already taken root. These last are called quicksets. In the provinces, says Columella<sup>s</sup>, they plant cuttings, for they will not be at the trouble of having nurseries. The expert husbandmen in Italy approve of this practice, because the quicksets are attended with several advantages. They are less apt to die; and by reason of the greater firmness of their wood, they sustain better the extremities of heat and cold, and other intemperatures of the weather: and the transplanting of them quickens their producing grapes. Cuttings may do in a loose yielding mould; but a strong heavy soil must have rooted vines, or quicksets.

Mr. Miller prefers good cuttings to rooted vines, for planting a vineyard; because the roots of vines do not grow strong and woody, as most sorts of trees do, but are long, slender and pliable; and therefore, after they have been taken up, they seldom strike out any fibres from the weak roots; but these generally shrivel and die, and thereby rather retard, than help, the plants in their growth, by preventing the new fibres from pushing out.

This difference of opinion between Columella and Mr. Miller may be accounted for, from the different depths at which they direct the vines to be planted: for were cuttings to be planted two feet and an half deep, no roots would shoot out from their lowest part; and if the rooted vines

<sup>s</sup> *Ibid.* c. 14.



were planted so superficially in Italy as Mr. Miller advises, they would be dried up by the sun.

Columella directs<sup>h</sup> that the nursery be made, neither in a poor hungry soil, nor in an ousy wet one; yet where there is moisture enough; and in a middling rather than a rich soil; because, though cuttings take root soon, and make strong shoots in a rich soil; yet, when transplanted, they shrivel, and seldom recover. It is therefore the husbandman's interest, rather to transplant from a middling soil to a rich one, than from a rich to a poorer. From a rich soil to a rich soil, they will thrive apace. It is not advisable to make the nursery in very poor land, because many of the cuttings will then die, and the others will arrive but slowly at a state to bear being transplanted.

The nursery should be trenched to the depth of two feet and an half, and being formed into beds three feet wide, the cuttings are planted in them at about a foot distance from one another, every way. This may be done either in the spring or in autumn. The spring is best if the climate be cold, or subject to much rain; and the autumn, if the climate be warm, and the soil dry, or situated on the side of a hill.

The length of the cuttings should be regulated by the distance between their eyes: for when these are near one another, the cutting may be shorter, and when they are more distant, it should be longer. This length should not exceed a foot, nor should it be less than three fourths of a foot, lest, being planted on the surface of the earth, the cutting should perish with drought in the summer; and, on the other hand, because when a cutting planted too deep has taken root, it cannot be taken up without some difficulty. If the cuttings are

<sup>h</sup> *Ubi supra*, c. 5.



planted on the side of a hill, their length may be about fifteen inches. On ousy ground, they need not have above three eyes, which may reduce them to nine inches, but certainly to more than six. In these three eyes are not included the numerous eyes which usually are on the cutting, near the part where it is taken from the stem: besides those numerous eyes, there should be three others, with joints. The cuttings should be planted so deep, as that the uppermost eye may be level with the surface of the ground; because all the sap will then be employed in one single shoot, which will consequently be so much the stronger. They should be planted as soon as possible after they are cut off the vine; and in doing this care should be taken to avoid a strong drying wind, or a scorching sun. It is therefore best to choose a calm day, or at least a day in which there is but little wind. The sun may be kept off by shades, or any covering. The nursery should afterwards be kept clear of weeds, and be frequently dug. Only one shoot should be reared, and that should be fastened to a stick or slender pole, to bear it off the earth. The rest should be carefully rubbed off; and this shoot should be pruned down to two eyes in the autumn. The strongest shoot from these eyes should be reared the next summer; and with this management the cuttings will be fit to transplant at the end of thirty or thirty six months.

Vines are likewise propagated by layers. For this purpose, a trench is dug four feet every way, that the layer may not be hurt by other roots. A shoot of the last year is then laid down in it, in such manner as to make it's end rise at the farther part of the trench. Four eyes are left on that part of the layer which goes to the bottom of the trench, and they are to put out roots. All the eyes between them and the stem should be rubbed off,



off, to prevent the growth of useless shoots. Two, or at most three, eyes are left on the farther end, which rises out of the earth, and all the rest, between them and those at the bottom of the trench, are rubbed off. The layer thus prepared soon takes deep root, and in the third year, it may be cut off from the mother vine. When the shoot is not long enough to rise again out of the earth, Columella thought of the following method. The end of the shoot is brought to the bottom of the trench, and the four lower eyes, left for the roots to shoot from, are covered with earth, as before : but instead of the eyes at the extremity, as in the former way, the two eyes next the surface of the earth, of that part which come from the stem, are left to make shoots, which they readily do, and in the third year, the layer may be cut from the mother vine, as in the other case. In order to encourage the roots to strike out, they need not be covered with the whole depth of earth the first year, unless it should become necessary before the winter, to keep the roots from being chilled by water which might gather in the trench.

## ARTICLE V.

### *Of planting the Vineyard.*

**T**HE ground being thoroughly prepared, by trenching, harrowing, and clearing it of every thing that can be hurtful to the vine, it is marked out, in order to be planted. The Romans planted their vines five feet asunder in a poor soil, six feet asunder in a middling soil, and at the distance of seven feet from each other in a rich soil. Sometimes too they left a space of ten feet  
between



between them, that there might be sufficient room for the strong shoots to extend themselves.

They generally planted their vineyards in a quincunx form, for which they marked out the ground by stretching across it a line trimmed with bits of red cloth, or of some other conspicuous colour, at such distances from each other as it was intended to leave between the rows. A piece of reed was stuck into the earth at each spot indicated by the cloth, and this was repeated till the whole field was marked out in equal distances. The planter followed, and dug a hole at each alternate reed, two feet and an half deep in level ground, two feet and three quarters if it lay sloping, and three feet deep where the declivity was considerable. He then removed the quick-sets from the nursery, taking them up with great care, and transplanted them the very same minute, if that was possible. All their shoots were previously pruned off, except one, which was the soundest and firmest, and of that only two eyes were left above ground. If any of the roots were hurt in taking them up, though all possible care was used not to injure them, they were cut off, very smooth. If two plants were set in the same hole, a few stones, of about five pounds weight, were laid between them in the bottom of the hole, to prevent their roots from interweaving together. They were likewise of opinion, that these stones saved the roots from being chilled in the winter, or scorched by the heat of the dog-days in the summer. Mago advised to lay the husks and stones of grapes mixed with dung, in the holes, under the roots of the vines, as a means of strengthening them, and of hastening the production of young roots. During the chilling wet of the winter, they gave a warmth; and in the summer, they afforded a nourishing moisture.

Columella



Columella disapproved greatly of putting two vines in the same hole, because their roots constantly mingled together, and formed a kind of net work, which retained too much moisture in the winter, and, by robbing each other of nourishment, proved prejudicial to both. If the soil of the vineyard was poor, Mago directed that the holes should be filled up with rich earth brought from elsewhere. The ground should be a little moist when the vines are planted; but it had better be dry, than mirey wet.

Mr. Miller orders that the ground, which he before directed to be fallowed, be again well plowed in March; and that after having laid it's surface even, the rows should be marked out, from South-East to North-West, at the distance of ten feet from each other. He then crosses these rows at the distance of five or six feet, and thereby marks the spot where each plant is to be set. The rows will consequently be, in this case, ten feet asunder, and the distance between the vines in each row will be five or six feet; nearer than which they ought never to be planted. If they are set in squares so near together as six feet, there cannot be room for a sufficient current of air to pass between them when their branches are extended on one side; and for want of that the damps in autumn will be detained among the vines, to the great prejudice of their fruit. In places abroad, continues he<sup>i</sup>, where they regard the quality of their wine more than the quantity, they never plant their vines at less than ten feet, row from row, and some allow twelve: and he confirms the justness of this rule by what happens to other fruits, which are never so well coloured, so early ripe, or so well flavoured, when in close

<sup>i</sup> *Gardener's Dict.* Art. VITIS.



plantations, as when they are produced on trees where the air can circulate freely about them, and the rays of the sun have free access to the branches, whereby the juices are better prepared.

Preferring cuttings to layers, as well as to rooted vines, he directs, that the cuttings be taken from the vine in the autumn, and that their ends, being made smooth, they be laid in the ground, about two inches deep, the rest of the cutting being left at full length; only observing to cover them with dry litter, or peas haulm, in dry frosty weather. In moist weather, the covering should be taken off, lest it heat, and make the cuttings grow, which would greatly injure them. In April, which he reckons the best season for planting vines in England, the cuttings should be taken out of the ground, and their upper parts cut off, so as to reduce them to about fourteen inches in length, according to the distance of the buds or eyes. He thinks it of great service to leave their tops on all the winter, because the air would otherwise penetrate the wounded part, and greatly injure the remaining eyes. The lower ends of the cuttings should be put in water, about three inches deep, setting them upright, for six or eight hours, before they are planted, in order to moisten them and open their pores: then, at the centre of every cross mark, before made, a hole should be dug with a spade, about a foot deep, and one strong cutting should be set, a little sloping, in each of these holes, which should afterwards be filled up immediately with earth pressed down gently to the cutting. This earth should be raised about three inches round each cutting, so as just to cover it's upper eye or bud, to prevent the wind and sun from drying it; for only that upper bud will shoot when the plant is thus managed.



Mr. Miller justly blames his countrymen for planting their vineyards, in the few attempts that have been made of them in England, with such grapes as are the sweetest and best for eating; this being contrary to the general practice abroad, where the rough austere grapes, which are by no means palatable, but which are by experience found to afford a noble rich wine, are preferred. This is also agreeable to the constant practice of the makers of cyder, who observe, that the best eating apples yield but a poor juice, and that the rough sorts afford a strong vinous liquor. I believe, continues he, that it will be found true in all fruits, that where the natural heat of the sun ripens and prepares their juices, so as to render them palatable; whatever degree of heat these juices have more, either by fermentation, or from any other cause, will render them weaker, and less spirituous. Of this we have many instances in fruits: for if we transplant any of our summer or autumn fruits, which ripen perfectly in England without the assistance of art, into a climate a few degrees warmer, these fruits will be mealy and insipid. So likewise, if we bake or stew any of these fruits, they will be good for little, because they will lose all their spirit and flavour by the additional heat of the fire: and on the other hand, many fruits which are not even eatable whilst raw, are thereby much improved. Some of these, which have been transplanted into a warmer climate, have been so altered by the greater heat of the sun, as to excel the very finest of the fruits that are ripened in this country. The grape most likely to succeed in England, is the Auvernat, or true Burgundy grape, which thrives very well in several places north of Paris.



Columella<sup>i</sup> advises every prudent husbandman to stock his vineyards with different sorts of vines, because the weather is not so equal in any year, but that it may be more hurtful to some, than to others. If, therefore, he plants but one kind of vine, and the weather happens to be prejudicial to it, he will be deprived of his whole vintage: but if he has vineyards of various sorts, some of them may escape, and yield him fruit. He recommends particularly, that each kind of vine be planted by itself; because otherwise one of the following inconveniencies will ensue; *viz.* either he must gather his late grapes with those that are early ripe, which will cause an acidity in the wine; or if he waits till the late fruit come to maturity, the early grapes will be rotten, or destroyed by birds or rain: for the distinguishing of each kind cannot be trusted to the gatherer's discretion. The flavour of the ripe grapes is hurt by the addition of the unripe; nor will the wine made of them both, mixed together, keep till it is old. When each sort is separate, the vine dresser will be able to prune and manage it in the most proper manner.

He cautions his readers strongly against the too prevailing opinion of those who imagine, that the chief care and trouble are at an end when the vineyard is planted. He observes, that the vine is a tender delicate shrub, which can every ill bear neglect, and which, when young, often destroys itself, by being permitted to run too much to wood, or to bear too great quantities of fruit. Most people are so intent on having much fruit, that they load the vine with too many bearing branches, without having any regard to future years, or to posterity; and then complain, that

<sup>k</sup> Lib. III. c. 20.



their vineyards do not answer their expectation, when they themselves have destroyed them, either through covetousness, negligence, or ignorance. When the vine has arrived at it's full strength and maturity, it can better bear some neglect. Believe Silvinus, says this excellent husbandman to his friend<sup>1</sup>, what I know from my own experience, that a vineyard judiciously planted with good vines, and well cultivated, never fails to bring it's owner a most abundant return. This he confirms from Græcinus, by the example of Pavidius Veterensis, who had two daughters, and a farm planted with vines. He gave the eldest daughter one third of his farm, on her marriage, and yet had as much fruit from the remaining two thirds, as he had before from the whole. He afterwards gave half of the remainder to the younger daughter, on her marriage, and still had as good an income as at first. This, says Columella, must arise from the remaining third's being proportionally better cultivated, than the whole had been before.

When the vineyard was perfectly well cultivated, and in a good soil, the Romans planted cuttings in the spaces between the vines, where they grew in the nursery. The vines and cuttings soon throve and gathered strength, when the ground was kept in so loose a state by frequent digging, as to be reduced to powder, and always perfectly free from weeds, which would consume the nourishing moisture that should feed the plants, whose roots extended easily in such loose mould. It was a general rule, that the diggings should be repeated once a month, from the first of March to the first of October; and all weeds were carefully pulled up by hand, and carried off the ground, lest they should take root again. Mr.

<sup>1</sup> Lib. VI. c. 3.



Miller says, that as the space between the rows of vines is great, the ground there may be sown or planted with any kind of esculent plants, provided they are kept at such distance from the vines, that these be not injured by them. This husbandry, which is also the method in France, may be continued three or four years, till the vines come to bearing: but after that, no sort of crop should be set between them in the summer; because, the clearer the ground is kept, the more heat will be reflected to the grapes. After they are gathered, a crop of coleworts, for spring use, may indeed be planted between the rows, and the stirring of the ground for them will be of great service to the vines.

## A R T I C L E VI.

*Of Pruning the Vine, and of it's future management.*

**F**ROM the time that the vine first begins to bud, all superfluous shoots must be carefully rubbed off, that the nourishment may be consumed by those only which are to be reared. Two shoots are generally set apart for growth; the one as a reserve, in case the other should fail. As soon as they rise, a prop should be set in the ground, for each of them. This prop should be slender, because the weak tendrils of the vine will then lay hold of it more easily than if it was thick. As the shoots grow up, they are tied to the props with a soft slack binding, till their tendrils have encircled them; and at less than four feet from the ground, sticks are fastened across the props, that the vines may extend laterally, and thereby be the less exposed to the force of winds. In nurseries, this cross stick, or rail, should not be



above a foot high, lest strong winds should tear the young plants out of the earth. When the shoots are grown nearly to their full height, their tops are broken off, to make them increase in thickness and strength, rather than run up into a needless length. The most thriving shoot, which is to be the leading wood branch, must be trained up strait, and kept clear of secondary shoots for three feet and a half from the ground: but such as grow above that height may be permitted to remain till the autumnal pruning; for if they are all rubbed off, new shoots will immediately spring out from other eyes, so that, perhaps, none may be left for the next year's buds. The shoots which are rubbed off from time to time should never be suffered to grow so strong, as not to be easily displaced with the finger; for the heat in summer hurts the vine greatly wherever it has been wounded with a knife. For this reason, if it should be absolutely necessary to use the knife, a piece of the shoot which is cut off should be left prominent from the stem, to stop the effect of the heat, which, in that case, will not proceed farther.

About the middle of October, or before the cold came on, the Romans *ablaqueated*, as they called it, the roots of their vines; that is, they laid them bare, so as to expose to view the upper small roots which the vine had put forth in the summer, and which should be cut off with a knife: for if these are suffered to grow large, the lower ones will decay, and the vine will then be nourished only by roots, which, extending themselves along the surface of the earth, or but little deeper, must be exposed to the inclemency of the winter's frost, and be liable to be parched by the drought and heat of the summer. Whatever roots appear within a foot and an half of the surface must therefore be cut off. The best way is to cut them about an inch from  
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the stem, and to leave that stump prominent; for if they are cut close, either others will shoot out, or the water which stands in the hollow made round the root, being frozen, will destroy the stem to the very pith, where the scar is: but both these accidents are prevented, by cutting them off at a little distance from the stem. And now will appear a reason why the vines should stand upright in the ground: it is, that if they are inclined, they must be liable to be wounded when they are ablaqueated; for while the digger is intent on digging, and forming a hollow round the vine, he may inadvertently wound the vines which grow obliquely, or even cut them quite through. If the winter is mild, the roots may remain uncovered till March; but if the severity of the weather forbids this, the hollows should be filled up by the beginning of December. Where the winters are very severe, some dung, or, if it can be easily come at, Pigeon's dung, or urine which has been kept a long while, should be laid to the roots before they are covered. The vines should be thus ablaqueated every winter, for the first five years; and after that, as the lower roots will then have got pretty sufficient strength, it need not be repeated above once in three years.

From these directions of Columella, we may assign a reason why Mr. Miller does not speak of ablaqueating the vine. Columella wrote for Italy, where the heat of the sun is very powerful, and dries the surface of the earth to a considerable depth. It was therefore necessary, in order to secure moisture for the roots, to plant and keep them deep in the earth: but as the degree of heat in England is much milder, as well as of shorter duration, and as the earth here is refreshed by much more frequent showers during the summer, Mr. Miller directs the vines to be planted much



shallower, and finds that it is not necessary to ablaqueate them. He rather guards against their taking too deep root.

The Romans reared all their vines in one stem to some height above the ground; and therefore, as soon as they had finished ablaqueating them, they cut off the weakest of the two shoots, which they called the shoot of reserve, and pruned the remaining shoot to two eyes. Mr. Miller directs that both the shoots be cut down to two eyes, and that the earth be drawn up in a hill about each plant, which will be a great defence against frost. The wound should be made obliquely, almost in the middle between the joints, lest water should lodge in the pith, if the shoot were cut horizontally: but the slope must not be toward the eye, lest this should be hurt by the trickling down of the sap, or tears, which will ooze from the wound. Mago recommends the spring, as the fittest time for pruning the vine; because, being then full of sap, it affords an easy passage to the knife: but Columella does not approve of this, unless it be in countries where the winters are very severe: otherwise, he thinks the autumn the best season\*. The early writers on husbandry forbid touching the vine with the knife during the first year; and Columella, who likewise disapproves of it, making experience his guide, neither suffered his vines to become wild, by running too much to wood; nor did he, by cutting off the young shoots entirely,

\* According to the authors of the *Maison rustique* (Tom. II. Part. 3. Liv. 6. c. 2.), it is an almost general rule in France, to prune young vines in the spring, and old ones in the autumn: though some very experienced husbandmen in that country think, with Columella, that it is best to prune all vines, whether young or old, as soon as their leaves are fallen off, that is to say, before winter.



force them to shoot from the stem, which seldom proves so fruitful as shoots from the young wood.

During the second year's growth, the ground should be kept constantly stirred, as in the preceding year, only with this difference, that it may be done once seldomer. The weeds must be kept under, till the vines, by extending their branches, shade the ground, and thereby prevent their growing under them. All superfluous twigs must be constantly rubbed off as before, and only one shoot should be permitted to grow up. The props must be continued as in the former year. If any of the plants died in the first year, two shoots may be reared up on the strongest of the vines next the vacant space; one to form the standard shoot, and the other to be made a layer, to supply the place of the dead vine. After the vintage, this shoot must be laid down, or if it be not long enough to rise out of the earth on the other side of the hole, only it's extremity need be put into the ground, as already directed. Next year, the layer must be cut half through, in the bend, that so it may not rob it's mother too much, but be brought too be nourished by it's own roots. When it is two years old, it may be cut off from the mother plant, and it's root must be carefully ablaqueated, that it may strike the deeper into the earth. If the neighbouring vines cannot furnish layers, a rooted vine must be brought from the nursery; for it is too late to recruit a vineyard, when we should be gathering it's fruit.

For the third year's growth, the vine must be supported with stronger and higher props than before. These should be fixed, either a foot from the vine, that they may not hurt the roots, and that so the vine dresser may dig all round the vine; or in the middle between two vines. The first way is the best, becaule the vine and prop mutually



support each other. If the prop is fixed near the vine, it should stand so as to shelter the vine from the north. It is of great importance that the prop stand very firm. On each upright prop must be put a cross pole, sufficiently strong to bear the weight of the fruit. This year the vine may be permitted to make two shoots, to cover the cross pole on each side with bearing branches, unless the vine be yet too weak to nourish them. All superfluous shoots and twigs must be carefully rubbed off. The ground must be frequently stirred, to keep it loose, and destroy weeds. The roots must be laid bare in October. The places of dead plants must be supplied, as directed for the preceeding year, and this must be a constant rule every year. When a vine dies after it has stood for some years, the hole or trench which is made for the layer or young plant, must be dug deeper and wider than it need to be after a young vine; in order that all the roots of the old one may be taken away. The trench should then be partly filled with fresh earth, or a good deal of dung mixed with the former soil. If each side of the vine has produced two shoots, and both of them shew plenty of fruit; yet one must be taken away, that the other may thrive the better, and bring it's fruit to greater perfection.

When this vintage is finished, the vine may be pruned so as, in a fertile soil, where it thrives well, to leave three eyes, to produce bearing shoots for the next year; but four eyes should seldom be left. The binder must separate these shoots, and tie them to the frame, to which another cross pole is now added, in the form of a star: or these cross poles may be supported by four props. The shoots spread in this manner become a counterpoise to each other. These cross frames are the more necessary if the vines are exposed to stormy



stormy winds, or if they stand on steep declivities, where every means of propping them is wanted. In warm and dry situations, the frame may be extended on all sides, in the form of an arched roof, the better to shade the thirsty earth: but in cold and frosty climates, the vines must be supported only on single frames or espaliers; for then the earth is more easily warmed by the sun, the fruit is more thoroughly ripened, and a freer passage is afforded to the air. The frames should not be lower than four feet, nor higher than seven. Young vines should be brought to this height gradually. The moister the soil and climate are, the higher should be the frame; for there, the thriving state of the vines admits of raising their branches, and their fruit being thereby raised higher from the earth, is the less liable to rot. In this situation, the winds blow freely through them, and dry up the dews and noxious fogs; the vines blossom more kindly, and yield a better wine. On the other hand, vines in a poor soil, on a steep declivity, and subject to scorching heat, require lower frames. If the vineyard is well placed, the best height is five feet; though there is no doubt but that the wine is the better flavoured, the higher the frames are.

If the vineyard is intersected by foot-paths which divide it into a number of small partitions, the sun and wind have the freer access to the vines; as hath also the eye of the master, which is of great advantage. The labour too seems less to the vine dressers, when it is thus portioned out in small divisions. The paths afford convenient passage for the grape gatherers, for those who repair the frames, and for bringing in manures, or what else may be wanted. The owner can likewise distinguish the fruitfulness of each spot, and thereby be enabled to apply proper remedies:



remedies. Where the rows of vines stand very far asunder, too much ground is generally left uncultivated between them; one half of which is commonly used for alleys, or foot-paths.

The trunk of the vine should be carried up strait to within a foot of the top of the frame; not only to conduce to it's beauty, but also to it's fruitfulness and duration: for the moisture which nourishes plants never has so free a motion through a crooked stem, as it has through a strait one; the bendings proving so many lets or hinderances to the equal circulation of the sap. The top of the vine should be fastened to the prop, so as to prevent it's being bent, or dragged down, when it is loaded with fruit; and for greater security in this respect, the arms, or branches, which proceed from thence, should be trained along the frame, and tied to it, so that only those parts of the shoots on which the fruit grows may hang sloping down from the edge of the frame: nor should this be at right angles from the binding, because that position would endanger their breaking. When thus situated, they are less exposed to rain and hail, than when they are fastened to the frame. They should however be tied up before the grapes are ripe, to guard against their being rotted by the dew. When the vine is five years old, it will be sufficient to leave one fruit bearing shoot on each of it's arms, or branches: but, some years after, when it has attained it's full strength, a luxuriant vine, in a rich soil, may convey nourishment to eight fruit bearing shoots; and, indeed, unless it be checked by a quantity of fruit, it will waste itself in wood and leaves: whereas a weak vine, in a poor soil, will soon be exhausted if it is burthened with fruit.

The branches of a vine should never be suffered to grow bigger than the stock: but, to supply  
their



their place, shoots issuing from their sides, should be trained; and as soon as these begin to bear fruit, the old hard wood should be cut away. Fewer bearing shoots should be left on the branch which extends northward, than on that which is directed toward the south; because this last requires the greatest shelter from the scorching heat of the sun, and therefore stands most in need of leaves. All suckers must be cut away from the root, and the place whence they sprung smoothed with a knife; for then it will soon skin over. No shoots must be suffered to grow from the trunk, nor should any knobs or warts be left on it. All dry, cracked, and shrivelled bark, must be taken off. Moss likewise, which shackles the vine, as with a fetter, and soaks it with it's pernicious moisture, must be carefully scraped off: and if the trunk is any way damaged, or rendered hollow by rain or insects, it must be cut away to the sound wood. The wound should then be covered with earth which has been moistened with lees of oil; for this will defend it from insects, sun, and rain, and therefore make it heal the sooner. All broad, ill shaped, withered sprays, and such as hang downward, commonly called dangles, must be cut off; and the strait shoots must be preserved. When the vine is freed from all these incumbrances, it will thrive the better, and yield the purer wine. The vine dresser should be particularly attentive, that all wounds in the solid wood be made sloping and round; because they afford the least lodgment to water, and are the soonest closed.

Sometimes a strong shoot strikes out of the fork of two of the leading branches, and cripples one of them. In this case, the crippled branch must be cut off, and the young shoot reared in it's stead: but if it be taken in time, the young shoot should be cut off. Whatever grows out of  
the



the trunk of the vine, must be cut away so smooth that no water may lodge in the scar: but what grows on the young shoots of the same year, should be cut off between the two first eyes; lest by cutting it too near the main shoot, this also should be hurt by the wound, and the neighbouring bud be killed.

As to the length of the fruit-bearing shoots, there is no general rule; for it may depend greatly on the quality of the soil, and the vigour of the vines, as well as on the distance between the eyes; for where the joints are shorter, a less length of shoot may be equally loaded with fruit. The last year's vintage should also be considered: for those parts of the vine which then bore great plenty of fruit, must be spared in the following year; and such as produced but a small quantity, may be loaded the more. Most particular care should be taken, that every cutting instrument which touches a vine, be sharp and well tempered; for otherwise, the labour of the vine-dresser is greater, and the vine is rather torn than cut; so that there then remains an uneven scar, in which the juices putrify, so as often to kill the vine.

Mr. Miller agrees with Columella in keeping the vine clear of useless shoots, and in the frequent stirring of the ground: only, as the vines in England are not planted so deep as in Italy, he cautions against digging too deep close to the vines, lest their roots be cut or bruised. He differs somewhat in the method of propping and pruning, which he directs to be done as follows.

At the beginning of May, in their second year, when the vines are shooting, two stakes, somewhat taller and stronger than those of the preceding year, should be fixed down to the side of each plant, and the two shoots should be fastened to them.



In the autumn, the vines which have produced two strong shoots of equal vigour, must be cut down to three eyes each. When they have a strong shoot and a weak one, the strong shoot must be shortened to three eyes, and the weak one to two : and such as have but one strong shoot, should be shortened to two eyes.

In March of the third year, two stakes should be placed down by the side of all such vines as have two shoots, at such distance on each side of the plant, that the shoots, fastened thereto, may form an angle of forty five degrees with the stem : but they should not by any means be bent down horizontally, as some injudiciously advise and practice : for the branches, then lying too near the earth, are generally injured by the damps which arise from thence, especially if they have fruit, which is never so well tasted, nor so ripe, as when they are a little elevated. In May, the strong shoots should be fastened to the stakes.

If the two shoots of the former year have produced two strong branches, the uppermost of these shoots upon each branch should be shortend down to three good eyes, not including the lower eye, which seldom produces any thing more than a weak dangling shoot ; and the lower shoot should be shortened to two good eyes ; these being designed to yield vigorous shoots for the next year, as the former are to bear fruit. Where the vines are weak, and have not produced more than two or three shoots in the summer, but one of these should be left with three eyes, for bearing : the other must be shortened down to two, or if it be weak, to one good eye, in order to obtain strong shoots the following summer : for nothing is more injurious to young vines, than leaving too much wood upon them, or over bearing them.



In March of the fourth year, all small horizontal roots, which may have been produced near the surface of the ground, should be cut off close to the trunk. A stake should be placed about sixteen inches from the root, on each side of the vine, and the bearing branches should be fastened thereto. Then another, and taller, stake should be thrust down near the foot of the vine, and to this should be tied the two shoots which were pruned down to two eyes. In May, the shoots which shew fruit must be fastened to the stakes, with bass, to prevent their being broken, until they are extended to three joints beyond the fruit; when they should be stopped, by nipping off the end: but the shoots which are designed for bearing the next year, should be trained upright to the middle stake; by which method, neither of them shading the other, each will enjoy the benefit of the sun and air. The shoots should be constantly kept in their right position, to prevent the inverting of their leaves; for when that happens, it greatly retards the growth of the fruit.

Mr. Miller very justly censures the absurd practice of those who pull off from their vines the leaves which grow near the fruit, in order to let in the rays of the sun, to ripen it; not considering how much they thereby expose their fruit to the cold dews which fall plentifully in autumn, and which, being imbibed by the fruit, greatly retard it: besides, no fruit will ripen so well when it is entirely exposed to the sun, as when it is moderately screened with leaves. By pulling off the leaves, which are absolutely necessary to prepare the juices before they enter the fruit, and of which juices the gross parts are perspired by them; the fruit must either be deprived of nourishment, or else, some of the gross particles will enter with the more refined parts of the juices, and thereby  
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render the fruit worse than it would be if the leaves were left upon the branches.

This naturally leads me to another opinion, which I have long been inclined to entertain: it is, that not only the stripping the vine of it's leaves, but also the summer pruning, which is intended to hasten the ripening, and increase the goodness of the grapes, has the contrary effect. For in the spring, and while plants are in a growing state, their juices are of a watery acid nature, abounding in what the chemists call their native salt. As the summer advances, or as, respectively in each, their seed, or fruit, begins to ripen, their juices lose that watery acid state, and become gradually milder: and when the seed, or fruit, is come to full maturity, the juices of perennial plants become of an oily mucilaginous quality. This change in the nature of the juices of plants is gradual, and perfect, in proportion to the flourishing state of the plant. Now, if a considerable length is cut off from the young shoots of the vine, while it is yet in it's luxuriant growing state, and the motion of the sap is still brisk in it; a check must be given to nature in her process towards perfecting the change in the juices. This is confirmed by the effects of numbers of facts and experiments\*. — As young shoots spring out again

\* A willow, a poplar, an elm, will remain for an age sound in the trunk, if it is suffered to grow without being lopped: but if it is turned to a pollard, the trunk soon grows rotten. Therefore, repeated lopping of the branches is very prejudicial.

The experiments of Mr. Mariotte, Dr. Woodward, and Dr. Hales, prove, that the leaves of plants are the organs of perspiration in them; that the greatest part of the sap goes off that way, and that the rest is spent in the increase of the plant. We likewise know, that the leaves imbibe the moisture of rain and dew, which greatly promotes the growth of the plant.— But in whatever manner they may be immediate organs of the perspi-

ration



again after this summer pruning, the juices are probably again brought to a thin watery state, in order to carry on that newly excited vegetation; the change of the juices into their milder and thicker state is thereby retarded, and consequently the richness and mellow ripeness of the fruit is impeded. It would therefore seem more advisable to defer shortening the shoots, till they have nearly arrived at their full length, and the grapes are beginning to ripen. The perfecting of the fruit requires so strong an exertion of all the powers of nature, that few, if any, young shoots will then spring out; by which means the buds for the next year will be preserved strong, and the grapes will arrive at a more perfect maturity.

Mr. Miller directs, that the vineyard, being now arrived at a bearing state, should be treated after the following manner. Too many branches should never be left upon a root, nor should those be too long: for although a management contrary to this may be productive of greater quantity of fruit, yet that fruit will not be so well nourished, nor will it's juice be so good, as when it is but moderately plentiful: neither will the roots of the plants be so much weakened in this last case, as they must be in the former. The ground should be constantly kept clear of weeds; and no sort of

ration of plants, or of the preparation of the sap; their great usefulness, and even the necessity of them, is manifest from the following fact.

If half, or two thirds, of the leaves of a young tree, in full sap, are stripped off, the tree will lose it's sap in two or three days. The bark, which before separated easily from the wood, will then adhere closely to it. Before the leaves were stripped off, the tree might be grafted by a scutcheon; but even the next day after, the bud cannot be inserted: consequently the tree is weakened by the loss of it's leaves.

M. Duhamel mentions his having actually killed trees, only by taking off all their leaves. *Culture des Terres*, Tom. I. c. 2.



plant should be suffered to grow on it, excepting that which it is intended to cultivate. It should be manured every third year, according to the nature of the soil. If the land is stiff, and inclinable to bind on the surface, sea-sand, or sea-coal ashes, are very good manure: but if it is loose and dry, a little lime mixed with dung will do it the most service. After each spring digging, the stakes are fixed as already mentioned, and the same care and management of the vines, as was before directed, must be continued. Mr. Arnoux says, that, in Burgundy, they bind the branches of the vine in an horizontal position, at the height of half a foot from the earth, to props three or four feet high, stuck into the ground, without any order, at the distance of about a foot asunder. They tie the shoots to these props as they extend in length, and find in this method the advantage that one branch is not shaded by another, but for as a little time as is possible.

Columella directs, that the props and frames be carefully examined after every pruning, and that whatever is amiss in them be repaired. Broad and flat props are preferable to round ones, and oak is the best wood they can be made of. Next to them, are round props of juniper, laurel, forest pine, and elder. Such as are rotten must be taken away, and new ones put in their stead. The bindings should be new every year. The ligature which fastens the stem to the prop should not be always in the same place, lest it should occasion a wound. The four branches should be tied gently to the cross poles, so as not to twist or bend them much. The shoots should be fastened so as that, when they grow beyond the frame, they may go shelving from it, and not hang by their binding, which would be apt to break them, especially when loaded with fruit. When two branches are so  
near



near together as to go to the same side of the frame, another pole should be placed between the cross ones, for one of those branches to be fastened to.

Those who are curious in gardening know what great things Dr. Agricola boasts of from the use of his mummies; in rearing the tenderest plants, as well as in raising forest trees from cuttings. The lees of oil, as Columella directs, mixed with fine earth, to give it a consistence, may probably answer the same purposes. Where lees of oil cannot be had, some other bitter vegetable substance might be contrived, which, being free from the acrid oil in all turpentine (as in Agricola's mummies) might prove very friendly to plants, and be particularly useful in preventing their wounds from bleeding, and in preserving them from being scorched by the sun, or hurt by insects. It is necessary that this substance be bitter, that it may hinder the insects from preying on the tender juicy fibres, for instance, of the vine, wherever a wound is made. Even loam, by itself, is found to be serviceable for these purposes; and so is either goat's, sheep, or cow's dung, well mixed with a due proportion of earth<sup>1</sup>. The vine-dresser should therefore constantly have some such substance ready to apply to every wound he makes in the vine. Perhaps too, it may prove useful to the cuttings, when these are planted, by retaining the juices, till they are employed in their office of vegetation, and thereby help to save them from being parched up by drought, as well as to render them less liable to be soaked in a wet soil, or by a rainy season.

<sup>1</sup> *Maison rustique*, Tom. II. Part 3. Liv. 6, c. 2.



## ARTICLE VII.

*Of marrying the Vine to Trees.*

**C**OLUMELLA<sup>m</sup> gives very particular directions for raising groves, in which trees grow till they are strong enough to become props for Vines; as also for making nurseries of trees proper for supporting vines, or being married to them, as the ancients termed it. The plenty of wood in this kingdom, and the still greater abundance it in America, renders that task unnecessary in this of work.

He recommends the poplar as the most friendly tree to the vine, next the elm, and then the ash. As the poplar has fewer leaves, and these are not relished by cattle (which is an object of great importance in Italy, where grass is scarce), many reject it. The ash, whose leaves are agreeable to sheep and goats, is chiefly planted in rugged and mountainous places, where the elm does not thrive well. The elm is the most frequently planted, because it agrees exceedingly with the vine, and cattle are very fond of it's cuttings.

When the trees are to be planted out, pits should be dug for them some weeks before they are removed. These pits should be made in a direction which may not interfere with the vine: as East and West, where it is necessary to plant the vine on the South-side of the tree, because of the cold; or South and North, where the vine is to be set on the East or West-side, of the tree. If the trees are planted in a field, where corn is to

<sup>m</sup> *De Arboribus*, c. 16.



grow, and in a rich soil, the distance between them should be about forty feet: but in a poor soil, where nothing else is planted, twenty feet will be sufficient.

Whatever tree it planted for the purpose of supporting the vine, it should not be pruned for the first two years. If it be an elm, and grows but slowly, all it's branches should be cut off, excepting one, which should be the fairest and straightest that can be singled out. If it does not grow so upright as one would wish, some inches of the stump of another brannch may be left near it, and by tying it thereto it may be trained up strait, in order to form the trunk of the tree. In the next year, the stump must be cut off and smoothed. If there is no branch fit for this purpose, the whole top must be cut off, at the height of nine feet, that cattle may not reach the young shoots. It should be cut with one stroke, if possible; otherwise, it should be sawed off, afterwards smoothed, and then covered with loam mixed with straw, to preserve the wound from the sun and rain. In two or three years, when a new head is grown, the useless branches should be cut off, and the rest formed into the following order. In a strong soil, an elm should not have a branch within eight feet of the ground; nor within seven in a poor soil. At these heights, three branches should be left as equally distant as can be, in the circumference of the tree, to form what is called the first story. At three feet above them, three other branches are left, but not in the same line as the lower ones, if there be a possibility of avoiding it, because these would rub against the tender buds of the shoots of the vine hanging from the higher branches, and shake off the grapes. The tree is to be formed into stories, in this manner, up to the top. The branches are suffered to extend more or less wide,



wide, as the soil is rich or poor, in order that the shoots of the vine may be spread accordingly. Care should be taken in lopping the elm, that the body of the tree be as little hurt as possible, and that the bark be not torn off, for this would do it great prejudice. The earth should be kept loose around the trees; and all suckers, or whatever else might shade the vine, should be cut away. When the tree grows old, and, either by a wound or otherwise, water lodges in it, a hole should be bored, or a channel cut, to give an outlet to the wet.

The vines should be planted before the trees are very strong. A young elm may bear a young vine, but it would be killed by an old one; wherefore their ages and strength should be proportioned. A trench must be dug for the vine, two feet and a half wide, three feet deep, five or six feet in length, and at least a foot and an half distant from the tree; for if it be planted nearer, the roots of the tree will not permit those of the vine to strike deep enough, and as the tree grows, it will oppress the vine. For a vine that is to be planted in the spring, the trench should be dug in the preceding autumn; that the earth may be mellowed by the winter's rain and frost: and if it is to be set in the autumn, the holes should be laid open some weeks before, that the soil may have the benefit of the sun and rain. Though Columella had before found fault with putting two plants in the same hole; he here advises to put two in each trench, a foot asunder, that they may the sooner clothe the tree. A northerly wind, and cold dews, should be avoided at the time of setting them. If the climate is temperate, instead of having two plants in the same trench, a trench may be made on the East and another on the West-side of the tree, and a vine may be planted in each;



by which means their roots will have sufficient room to extend in. Though Mr. Miller, as I observed before, thinks it of little consequence whether a tree that is transplanted be set to the same aspect as it had in the nursery; Columella recommends, as a circumstance which is attended with great advantage, particularly to vines (but he extends it to all trees which are removed from the place of their first growth), to mark them before they are taken up, in order that the same side may still be turned to the sun. In dry and warm situations, where neither a severe winter, nor a very wet one, need be feared, the autumn is the best season for planting both vines and trees; laying under their roots the depth of half a foot of the richest and finest mould, and covering them with well dunged earth. The vine should be planted in the trench with its stem inclining to the tree, against which it is to rise up strait: and it must also be defended from cattle. In hot countries, the vine should be planted on the North-side of the tree; in cold ones, on the south; and in temperate climates, either on the East or the West, that it may not be all the day in either the sun or the shade.

In the next autumn, the vines are pruned, as already directed, for frames. When they have reached the first story, shoots should be distributed to each branch, leaving a leading shoot, which is to go up to the top of the tree: and thus each story is gradually covered. It is a rule with many, to load chiefly the lower part of the tree, because there the vine bears most grapes, and they are most easily gathered: but those who regard the quality more than the quantity of their wine, clothe the upper branches most, and garnish the rest with bearing shoots in proportion to their strength. The future pruning consists in cutting off the  
shoots



shoots which bore fruit for the last vintage, and in rearing others in their place. If the vine is very thriving, the bearing shoots may be permitted to hang down sloping from the branch, to which their extremities should then be brought back, and tied: or if the vine is very luxuriant, they may be carried to the next tree. Though these shoots yield a great deal of fruit, they must be cut off at the next pruning, because, otherwise, they would weaken the vine too much. No shoots should be suffered to grow out of the firm wood, unless they are wanted in order to marry them to a widowed branch.

The young vine is tied to the tree at about four feet from the ground, and with this binding it's growth may be checked, if it be too luxuriant, or if the tree has been deprived of it's branches. It should be tied again at about half way up, and a third time at the top. The vines should be loosened every year, because they are then most easily pruned and cleared of all imperfections; and they are refreshed by being bound in new places. They are also then in less danger of being galled by the binding. The bearing shoots should be so laid on each branch, as that, being tied above the third eye, they may hang slanting down: but they must not be tied tight, lest the binding should cut them. At the same time that some shoots are thus laid for bearing fruit, others should be trained up to the body of the tree, to produce wood for the next year.

If the vine does not clothe the tree sufficiently, a shoot may be turned down to the ground at the autumn pruning, and made a layer, from which as many young plants may be raised, as, being led up to the tree, will cover it enough. When the trees decay, young ones should be immediately planted in their stead; and when the vines begin



to be worn out, they should be renewed by layers from neighbouring vines, as we shall soon see judiciously and successfully practised by M. de Chateauvieux, rather than by quicksets.

To the foregoing directions for the cultivation of tall vines in Italy, and the same are equally applicable to all other warm countries, Columella adds <sup>n</sup> the following account (which I shall likewise abridge from him) of the manner in which vineyards of lower growth were managed in the provinces of the Roman Empire.

The husbandman there never trenched all the ground, but only opened a deep furrow, in which the vines were set. This might be sufficient where the soil was naturally loose. In some of these vineyards, the plants stood without any props; in others, they were fastened to rails; sometimes they were tied to dwarf trees; and sometimes they were suffered to run upon the ground. In the first of these cases, a single stem was reared up, free from side-shoots, till it had acquired strength enough to support the fruit bearing branches, which, when they were of a sufficient length, were bent down in a circular form, and tied to the lower part of the stem. In the second case, the fruit bearing shoots were trained to rails, or espaliers, as they grew. In both these ways, the planting, pruning, and other culture, differed so little from the general directions already given, that it would be needless to particularise them here; especially as I shall soon have occasion to speak pretty fully of the management of low and of middle sized vines, as now practised by the French, whose best vineyards consists of none else. As to letting them trail upon the ground, Colu-

<sup>n</sup> *Lib. III. c. 14, and alibi.*



mella justly thinks it so bad a method, that no excuse can possibly be offered for it, unless the country be indeed uncommonly subject to very high winds: — and then, perhaps, a doubt may arise, whether such a place be at all proper for the vine.

In Gaul, the trees for supporting the vines, besides being kept very low, were, of choice, such as had the fewest leaves. The poplar was therefore much esteemed for this purpose; for which the hornbeam, the mountain ash, and sometimes the willow, were also reared. The willow was planted only in moist places, where other trees could not thrive well; because it was thought to hurt the taste of the wine. The elm was likewise so managed, whilst young, as to be turned to a dwarf; as it may easily be. In dry and hilly situations, the stories of these trees were about eight feet high; and in vallies, or moist places, about twelve feet. These trees were generally divided into three branches, out of which several lesser boughs arose; and all the small twigs were usually cut off, at the time when the vine was pruned, to prevent their shading the fruit too much. If the dwarf trees were planted where corn grew, they were set twenty feet asunder in rows forty feet distant from each other: but when they were planted where there was no corn, their usual distance was twenty feet every way. Here the young shoots of the vines were more frequently carried from one tree to another, than when the trees grew high. If the trees were too far asunder to afford a support to the shoots, poles were extended between them, and these were up-held by props, as soon as the weight of the grapes began to be too heavy for them. In all other respects, the culture of the vine was the same as in Italy.



In clearing the vines of their superfluous shoots and leaves, Columella observes that, in the provinces, in places which were shaded, or where the sun had not much force, or which were moist and cold, the vine dressers used to strip the vines of many of their leaves, that the fruit might be the better ripened by the warmth of the sun, and not be rotted by too much moisture: but in places that were dry, warm, and exposed to the heat of the sun, the grapes were left covered with their leaves and twigs; and if the vine had but few shoots and leaves, the fruit was sheltered by some other covering, "Thus," says he (in the passage before quoted<sup>o</sup>), "my uncle, Marcus Columella, " a man skilled in all the liberal arts, and the most " diligent farmer in Bœtica, covered his vines with " mats in the beginning of the dog days; because, " during that season, the country was subject to a " scorching easterly wind, which, like a fiery va- " pour, burnt up the grapes, if they were un- " covered."

That the reader of this work may receive every useful information in my power to give, and that as much light as possible may be thrown on a subject which, with due attention, and the experience of a few years, may undoubtedly be rendered an object of such high importance to the industrious and deserving inhabitants of several parts of our immensely extensive territories in America, as to procure very great advantages to them, and at the same time save to their mother country at least a considerable part of what it now costs her for the wines of other nations, some of which make her but little, or no requital in trade; I have consulted carefully the writings of the most



celebrated among the moderns who have treated of this branch of husbandry, and shall here add, from them, the few following remarks on the culture of vineyards in France.

## ARTICLE VIII.

*The present method of cultivating Vineyards in  
FRANCE.*

AFTER observing that, though each province of that kingdom has it's peculiar manner of dressing and managing the vine, as well as of making wine, yet these differences are not at all essential, as the fundamental rules of practice are constantly the same, and no way affected by a few variations which custom has retained in particular places, and which serve only to conduce to the perfecting of this art; the authors of the *Maison rustique* draw their precepts <sup>p</sup> from the actual and most approved practice of Burgundy, Champagne, and Orleans, the wines of which countries are deservedly held in the highest estimation.

Their directions for the choice of the soil, it's situation, aspect, the manner of planting it, and the future cultivation of the vine, are so like to those of Columella, that it would be needless to repeat them here. — They are, indeed, more explicit as to the grafting of the vine, which is performed in cleft, as for many sorts of fruit trees, but with this difference, that a smooth part of the vine, at the distance of about seven or eight inches from the stem, and between two joints, is the

<sup>p</sup> Tom. II. Part 3, Lib. 6. c. 1.



most eligible part for inserting the cion, which, as repeatedly said before in other similar cases, should always be taken from the best bearing branch of the most fruitful vine. All small roots are cut away from about the place where the graft is to be inserted, and after it has been exactly fitted in the cleft, so as to make the inner bark of the cion coincide precisely with that of the stock, the wound is carefully bound up tight with slips of the inner bark of a young lime tree, of a willow, or with bafs, in such manner as effectually to preserve it from the entrance of air or wet. The graft and it's stock are then bent gently downward into a hole made on purpose to receive them, and are covered with earth so as to leave only two eyes of the cion above ground. The cion should be used as soon as possible after it has been cut, and it's length should be about twelve inches<sup>q</sup>.

Neither the middle sized vines, nor the low ones, of which two sorts all the best and principal vineyards in France consist, should be shaded by any neighbouring buildings, or trees. The tall vines in the southern provinces of France, such as Provence and Languedoc, are, like those in Piémont, Italy, and other very warm countries, reared up to trees, or formed into alcoves or arched walks, the better to defend them from the too scorching heat of the sun. The sorts thus planted are chiefly the *cioutat*, the *corinth*, the *Damascus* grape, and the *bourdelais*. The vines about Auxerre are trained up against espaliers and trellises; but those of the lowest growth, of which most of the vineyards about Paris, Beaune, Tonnerre, Chablis, &c. consist, are fastened only to common props, and are generally found to produce the greatest quantity of fruit, and, in some years, the best wine.

<sup>q</sup> *Ibid.* c. 2. Art. 4,



The people of Champagne, (who think that there is in the soil of their province a quality so peculiarly fit for the production of fine wine, as can never be found or imitated elsewhere,) plant their tallest vines in their middling lands, and the low ones in their best grounds. The former of these are reared to the height of four or five feet, and the latter to about three. They observe, that their vineyards yield the highest flavoured wine when they are most exposed to the sun; and therefore they always prefer a sloping situation, fully open to the south, for their best growths. They also prefer ground which is somewhat stony, and not naturally subject to much moisture. They manure this soil from time to time, by laying on dung and fresh earth; but with caution not to use too much dung, because that would render the wine flat and insipid, and apt to become ropy. They think cows dung better than that of horses, for their finest soils, because it is not so hot: but for stiff lands they use thoroughly rotted horse-dung, and sheep's dung, which they mix with about double the quantity of cow dung, to prevent it's burning the roots of the vines. Towards the end of autumn, they spread in trenches cut across the vineyard, layers of this dung and of fresh earth, and after this mixture has remained there all the winter, to moulder, and grow mellow, they lay about half a basket full of it, early in the spring, to the roots of each vine, and particularly to those of the latest planted; making for that purpose a hole around it, deepest at it's back, where the sloping ground is highest. This is done over the whole vineyard either every eight or tenth year, or, which amounts to the same, to an eighth or a tenth part of it each year.



The grapes most generally cultivated in Champagne are a small black sort; and to render the wine of that country the more perfect, great care is taken to root out all white ones, and such as, though black, are large and coarse: or, if those vines are not pulled up, they are grafted with such fruit as is desired.

About the end of June, and sometimes even in May, according to the forwardness of the vine, the upper end of each shoot is nipped off, in order that the greater quantity of nourishment may be conveyed to the fruit; for it is best that no part of a low vine be more than two feet and an half, or three feet, high from the ground. These low vines are *earthed*, as it is called, every spring; that is to say, they are inclined down into a hole dug close to them, and their shoots, being previously pruned to such lengths as are most consistent with the vigour of the vine, are covered with earth so as to leave only three or four of their eyes above the ground.— In upper Picardy, it is the custom to renew, as it is termed, the vineyards every year, by burying the vines in this manner, and converting each branch into a layer.

It is a general rule, that the stronger the soil is, the farther asunder the vines should be planted; and that no layers, grafts, or cuttings should be used, but such as have a smooth shining bark, and of which the wood is of a clear green when cut. Those that are of a brown green, when a little bit of their rind is raised up with a knife, are rejected, as good for nothing.

To guard against the bad effects of frosts and fogs, the French vine-dressers, whenever they apprehended any danger of that kind, lay along that side of the vineyard from whence the wind blows, a ridge of dry litter, or straw, which they then burn slowly: but if, notwithstanding this,  
the



the vines are frozen, they cut them down very low, to enable them to bear the better the next year.

They hold it to be necessary, after a thick fog, to water their vines with juice of the roots or leaves of wild cucumbers, or with powdered coloquintida, mixed with water; and they are also of opinion that late pruning is frequently a means of guarding against the mildew, because their vines do not then blossom till the sun is become very powerful.

Careful husbandmen never suffer any one to go into their vineyards very early in the morning when dews or damps fall in May, June, or September; because the dew of those months, being generally cold, would blister the leaves of the vines if it were to be touched, and thereby fixed upon them before the rising of the sun, which afterwards removes that danger by drying up and exhaling the moisture: neither do they allow them to be entered, on any account, immediately after a hasty spring-shower, while the leaves are yet wet therewith, or when they are covered with a rime or hoar-frost.

Sea-water, salt and water, or stale urine mixed with dung and earth, are of excellent service to vines which do not bear well, and to those whose leaves turn red for want of moisture: and it is said that, when their leaves become white and dry, when their wood swells, and when their fruit drops off, all which are symptoms of decay, they are recovered by rubbing the stem, and watering their roots, with ashes reduced to powder and mixed with strong vinegar.—It is most certain that stirring of the ground around them, and keeping it in a fine loose state, will have this desirable effect; or rather it will keep them constantly in



so vigorous a condition, that there will never be occasion to recur to other means to promote their fertility : neither will there, if this essential principle of vegetation is duly applied to, be any danger of the grapes shrivelling or growing dry upon the vine ; to remedy which, if it should happen through careless management, the authors before quoted direct to pull off all the fruit thus injured, and to water the roots of the vine with stale urine. They add, that if the grapes rot upon the vine before they are ripe, some old ashes, or barley meal should be laid around the stem.

If the vines, as was before observed of other trees, are sprinkled with water in which tanners have dressed their hides, no cattle will touch them.

The young leaves and fruit of the vine are often greatly injured by very small green flies, which conceal themselves in the young buds, and weave there a thin web, not unlike to that of a spider, in which they deposit their eggs. All these webs, and the leaves on which the eggs have been laid, as well those which still adhere to the vine, as those which have fallen off, must be carefully collected, and burnt out of the vineyard.

As snails and slugs, which do great damage to the vines, generally hide themselves during the middle of the day, they should be carefully picked up early in the morning, or just after dew or a shower of rain has fallen, especially in the spring and autumn, which are the seasons when they appear most ; and they should be crushed to death, or burnt.

The vine-fretters, which the French call *gribouris*, abound most in the lightest land. When a vine is attacked by these insects, it's shoots are short and meagre, it's leaves are full of holes, and it yields



yields but very little fruit, and that extremely poor, though never so great pains be taken to cultivate it. These insects are much smaller than the smallest gnats, which they resemble both in shape and colour. They prey upon the vine during the whole year; for, in September, they get into the ground, and there gnaw it's roots, especially those of young plants; and in May when the buds of the vine swell, they leave their former holes, feed upon the surface of those buds, and then upon the leaves, and afterwards they fix upon the grapes, pierce their skin, suck out their juice, and lay in them their eggs, from whence proceed an infinite number of little worms, which complete the destruction of the fruit by the time it should be gathered. To prevent this mischief, the authors of the *Maison rustique* advise<sup>r</sup> the sowing of a few patches of beans in different parts of the vineyard; because these pernicious insects will then resort to them, and may consequently be destroyed by plucking up the beans and burning them.

To get rid of numbers of other insects, all of which endeavour to find a place of shelter when the winter approaches, either by creeping into the ground, or into dung or any litter that lies upon it; they recommend the method before mentioned<sup>s</sup>, of laying a little heap of haulm, straw, or any kind of mulch, round the stem of each vine when the weather begins to be frosty, and burning it in the spring, in a place out of the vineyard. Innumerable multitudes of vermin will be destroyed by this means: but, to render the remedy effectual, the neighbours all around must have recourse to the same expedient, or these pernicious creatures will soon spread a-new from one vineyard to another.

<sup>r</sup> *Ubi supra*, c. 2. Art. 5.

<sup>s</sup> Page 315.



Mr. Miller's method of guarding against flies, and wasps, which are often so very numerous, and voracious, as entirely to eat up all the finest and highest flavoured berries of well ripened grapes, deserves much attention even in vineyards, though it is more easily practised in gardens: but the preventing of this mischief will make ample amends for yet greater trouble. It is, before the grapes are quite ripe, and consequently before they will be in much danger of being attacked by these enemies, to hang upon the vines, from space to space (the nearer the better), phials half filled with sugared water, and rubbed at the neck with a little honey. These will attract the wasps and flies, which, in attempting to get at the liquor, will fall into the phials, and be drowned. They must be carefully looked over every third or fourth day, to take out and destroy the flies and wasps, and to replenish them with liquor.

If, when the fruit is ripe, the stalks of the bunches are cut half through, about a fortnight before they are gathered, the juice of the grapes will be much improved thereby; because, as not near so great a quantity of nourishment can afterwards enter the fruit, the watery particles will have time to evaporate, and the juice will be the better digested. This is practised by some of the most curious husbandmen in the south of France. But if, after the bunches are cut off the vines, they are hung up in a dry room, upon strings, so as not to touch each other, for a month before they are pressed, both the strength and the flavour of the wine will be yet more exalted. To this, in a great measure, is owing the delicious richness of the vines of that part of the Tirolese which borders on Italy, where it is the constant custom



custom to keep the grapes thus for some time before they are used, as was remarked by Dr. Burnet in his travels, and, since him, by a much more accurate observer, M. de Blainville<sup>t</sup>.

## A R T I C L E IX.

*Of the principal sorts of Grapes, with the uses for which, and the time when, they are good<sup>u</sup>.*

THE best and most general sorts of grapes, either for the garden, for wine, or for verjuice, are 1, the *morillons*; 2, the *chasselas*; 3, the *muscats*; 4, the *corinths*; 5, the *malmfies*; 6, the *bourguignons*; 7, the *bourdelais*; 8, the *sans-moireau*, or grapes without stones; 9, the *melier*; 10, the *gamet*; and 11, the *gouais*.

1. The *morillons* are of several sorts, almost all of which are well known in most places, and of which some are very good, both for the table and for making wine.

The early *morillon*, which we call the *July* grape, has small, round, black berries, growing loose on the bunches. It ripens in England about the beginning of August, has a sugary juice, with but little flavour, and is very apt to be eaten by birds and flies. It may be allowed a corner in the garden, well exposed to the south, and sheltered from the wind: but it's only merit is it's ripening early.

The *morillon taconné*, or *black cluster*, likewise called the *meunier*, or *miller*, from the hoary down of it's leaves, ripens somewhat later than the for-

<sup>t</sup> Travels through Holland, Germany, Switzerland, and Italy.

<sup>u</sup> *Maison rustique*, Tom. II. Part 3. Liv. 6, c. 1. and MILLER'S Gardener's Dict. Art. VITIS.



mer, yields plentifully, and makes good wine. The bunches of this are short, the berries oval, and so close together, that many of those on the inside continue green, when the outer ones are perfectly ripe. It delights in a sandy light soil, ripens here in September, and is by some called the *Burgundy* grape: but this name belongs more properly to

The common *black morillon*, which the people of Burgundy distinguish by the appellation of *pineau*, and which those of Orleans term the *auvernat*, because it came originally from Avergne. It's berries are oval, and hang looser on the bunches than those of the black cluster grape; by which means they are ripened more equally. This sort is very sweet, sugary, black, good to eat, grows well in almost any soil, and yields an excellent wine. It's leaf is rounder than that of any other sort of grapes, and it's wood, when cut, is redder. The best sort is that whose joints are not above three fingers breadth asunder. Another species of this *morillon*, to which the French give the name of *pineau aigret*, or *tartish tasted pineau*, has longer, thicker, more pithy, and less compact, wood than the former; it's joints are at least the breadth of four fingers asunder; the outside of it's bark is very red, and it's leaf is divided into three parts, like that of the fig tree. The berries of this are smaller, and hang in looser clusters, than those of the foregoing sort; nor does it yield much fruit: but the wine that is made of this fruit is strong, and even better than that of the preceeding species. A third sort of *morillon*, which the French distinguish by the appellation of *franc morillon*, *lampereau*, and *beaune*, blossoms earlier than the others, and yields equally good wine. The wood of this is black, as is also it's fruit, which promises greatly whilst green, but above half of it is generally



rally lost before it attains to a proper maturity. This vine runs into wood more than either of the former sorts, and it's joints are farther distant from each other,

There is also a *white morillon*, which is excellent to eat, but it's skin is harder than that of the common black *morillon*; and there is likewise, of this species, the Orleans *gray auvernât*.

2. The *chasselas*, otherwise called *muscadet*, or *white bar-sur-aube*, is a large, white, and excellent grape, either for eating, for keeping long, for drying, or for making good wine. It's berries do not grow close together; and it is peculiarly fit for stony vineyards, because it ripens there the most easily. There is another sort of *white bar-sur-aube*, a species of the large *corinth*, which will be spoken of hereafter.

The black *chasselas*, known in Provence and Languedoc by the name of the Greek grape, is scarcer than the white: and so is also the red, the berries of which are likewise bigger. Both of these are excellent.

3. Almost all the *muscat* grapes are exquisite.

The *white muscat*, or *Frontignan*, has long, thick, and very closely clustered bunches. It is excellent for eating, for preserving, for making wine, or for drying in an oven or by the heat of the sun. As the berries of these grapes are very small, and grow extremely close together, they should, especially where it can be done with most ease, be carefully thinned early in the season, that the sun and air may not be hindered from entering them, and that they may not be rotted by the moisture which would otherwise be detained.

The *early white Piémont muscat*, which deserves singular esteem, has longer bunches, less closely clustered, and more unctuous.



The *red* or *coral muscat*, so called from the liveliness of it's colour, has the same qualities, it's berry is yet firmer, and requires a pretty deal of sun to ripen it well.

The *black muscat* is larger, and grows extremely close. It has not so high a flavour; but it is very sugary, and is much esteemed, because it is a great bearer, and it's fruit ripens pretty early.

The *purple muscat* is of a less deep colour, and bears very large bunches, which are well garnished with large high flavoured berries. This, and the *red*, yield the most vinous juices of all the sorts of muscats.

The *malmsy muscat* will be spoken of under the head of malmsy grapes.

The *ribezatte muscat* has a pretty strong flavour of musk: it's berry is smaller than that of the other sorts, and it's juice is so sweet and agreeable, that it would be accounted one of the first of grapes, if it was less apt to shed it's blossoms \*, and also, if it was less apt to degenerate.

The *long muscat*, or *passé-musqué* of Italy, has very long and big bunches of large oval berries, hanging somewhat loose. This is scarce, and does not ripen without a great deal of heat: though, if it be but half ripe, it is the best of all grapes to preserve for a sweet-meat; the fire exalting that fine flavour in it, which the sun had not time, or power to perfect.

The long *purple muscat*, which some call the *Madeira* grape, is rare; but uncommonly beautiful and good.

There is likewise the *Jesus muscat*, the berries of which are very large and round. This has a very high perfumed flavour, and is extremely scarce.

\* The consequence of a vine's shedding it's blossoms is, that what would otherwise become a bunch of grapes, turns into tendrils, or claspers. *Mais. rust. Tom. II. Part. 3. Liv. 6. c. 6.*



The *gennetin*, otherwise called the *Orleans muscat*, belongs also to this species of grapes. It is very sugary, apt to shed it's blossoms, and resembles the *melé*, or rather the *malmsey*; for which reason some call it likewise the white *malmsey*. The dealers in wine at Paris often sell the *gennetin* wine for the true *muscat* of *Frontignan*.

4. The *black corinth*, or, as it is vulgarly called, the *currant* grape, is sugary and delicious. It's berries are round, very small, and closely clustered on the bunch, which, for it's thickness, is rather long; and they have not any stone.

The *purple corinth* is a little bigger than the black; like which it is an excellent fruit, and has no stone: but it is very apt to shed it's blossoms; for which reason it should be pruned longer than other vines.

The grape *without stones* is a sort of white *bar-sur-aube*, but it's berries are smaller, and somewhat tarter. It is very fit for drying, because it has not any stones: for which reason it is often called the *large corinth*, or *currant* \*.

It

\* As dried grapes, whether of the large sort, which are then termed *raisins*, or of the smaller, which are called *currants*, may undoubtedly, and with great ease, be rendered a branch of trade very profitable to several of our colonies; I shall here transcribe, from Mr. Chamber's *Cyclopædia* (Art. CURRANTS), Sir George Wheeler's account of the manner in which the people of the Archipelago prepare and pack up the *currants* of which we import annually great quantities from thence.

They gather these grapes in August, spread them in layers on the ground till they are dry, then clean them, and lay them up in magazines, which the natives call *seraglios*; pouring them in at a hole, till the magazine is full. They cling so fast together by their own weight, that they are forced to be dug out with iron instruments. To barrel them for sending abroad, they have people who grease their feet and legs, and tread them close, that they may keep the better. When thus packed, or when made up in bales, they may be kept two or three years, without stirring, or giving them air. — The island



It is to be observed, that all the *muscats* and *corinths*, being apt to shed their blossoms, should be pruned long, or grafted upon the *bourdelais*, when it is not desired they should have a strong musky flavour.

5. The *malmsey* grape is of a grayish colour, and the vines which produce it are great bearers. It's berries are small, but very sugary, high flavoured, early ripe, and so full of juice, that, like the Orleans gray auvernat, it is reckened one of the most melting grapes. The *red malmsey* is of a flame colour, and has the same qualities as the sort before mentioned. The *white malmsey* is scarcer, and ripens less early. The *gray malmsey* is the most used, and generally thought to be the best of the three.

There is likewise the *musked malmsey*, otherwise *muscat de malvoisie*. It comes from Mont-ferrat: the country around Turin is full of it; and it's flavour of musk is higher than that of any other grape.

6. The *bourguignon*, or *tresseau*, is a pretty large black grape, better to make wine of, than to eat. The vines of this species bear most plentifully, and their branches are of a good size.

The *white bourguignon*, called in some places *mourlon*, and in others the *clozier*, has joints at the distance of two fingers and an half broad from each other, it's fruit grows on a short stalk, it's

of Zant produces every year currants enough to load five or six vessels; Cephalonia three or four, and the other islands one. The English have a factory at Zant; the Dutch two or three merchants, and the French one: the English consuming more than six times the quantity that both France and Holland do together.

The same method, or so nearly the same that the difference is no way material, is practised in Spain for making raisins: and if the heat of the sun be not alone sufficient to dry the fruit, an oven may be used. The best are however, those which have been dried by the sun only.

bunche



bunches are closely clustered, it's leaf is very round, like that of the *guoais*, and it endures frosty weather.

The *noiraut*, or *black grape*, otherwise called the *dyer*, or *Spanish plant*, is another sort of black *bourguignon*. It's wood, like that of the former, is hard and very black; the pith of this wood is small and compact; it's joints are short; it's leaf has a red stalk, is of the middle size, and quite round. It resists the frost better than any other vine; but it's juice is very flat, and serves only to give a deep colour to the wine it is mixed with; for which reason a few, and but a few, of these vines are planted in each vineyard that is to produce red wine. It is also good for wounds. The dyers give a great price for the wine that is made of this grape, to dye their cloths with.

7. The *bourdelais* is of three sorts, *viz.* white, red, and black. It's bunches, and their berries, are very large. It is used chiefly to make verjuice, and for sweet-meats. It is likewise an excellent stock for grafting all sorts of grapes, especially those that are apt to shed their blossoms, such as the *Damascus*, the *corinths*, and particularly the purple kind of this last species. The *muscats* may also be engrafted on it, and so, in short, may all other vines.

The *apricot grape*, the *Greek vine*, and the *fari-neau*, are three species of the *bourdelais*.

The *apricot grape* is so called, because it's fruit is of a golden yellow, like the apricot: it's bunches are beautiful, and very large.

The *Greek vine*, likewise called the *marvellous grape*, and the *St. James of Galicia*, because that part of Spain is full of it, is red, bears large, round, and sweet berries, which ripen early, and make good wine. It produces very large, and beautiful bunches; and when the fruit is ripe, it's leaves become streaked and bordered with red, as is fre-



quently the case of all vines whose fruit is variegated with black, purple, and red.

The *farineau*, or *rognon-de-coq*, as some call it, is white, has small long berries, and is fitter to make verjuice than wine.

8. The *sans-moireau*, which the people about Auxerre call *quille-de-coq*, is a black grape, excellent for eating and for making wine. It's berries are somewhat long, firm, and closely clustered. There are three sorts of this vine: the wood of the first and best is hard, and has short joints; the second is very like the first; and the third, called the *sans-moireau chiqueté*, or *white prunelas*, because it has whiter wood than the others. It yields but a flat wine, bears only in some years, and it's berries are apt to drop off entirely before they are fit to be gathered.

The *red prunelas*, or *negrier*, has a red rind, long jointed wood, thick pith, a jagged leaf, and bears large bunches of transparent and very red grapes. It is one of the latest ripeners, and yields a lasting, but rough wine; for which reason a few only of these plants are set in vineyards of black grapes; but just enough to deepen the colour of the wine, and to give it a body. It resists frost, because it's stem is tall and strong.

9. The *white melié* is one of the best of grapes for making wine, and for eating. It yields greatly, and has a good juice, which keeps pretty well. It is an excellent fruit for drying.

The *black melié* is neither so well tasted, nor so vinous, as the white.

The green *melié*, which some call only the *green plant*, is the most esteemed of this species of grapes, because it yields greatly, does not shed it's blossoms, and the wine made of it never turns yellow.

The *surin* is a species of the *melié*. It's berries are somewhat oblong, and a little pointed. The fruit



fruit of this vine has an excellent flavour, and is greatly liked in Auvergne.

10. The *gamet* is a very common grape, yields plentifully, and grows more easily than any other: but it affords only a very weak wine, which has but little flavour; nor does this sort of vine last many years. There is a *white gamet*, and a *black gamet*.

11. The *gouais* is likewise very common. One sort of it is white, and another purple, with a bloom, like that on plums. Its vine will last an hundred years in the ground. It bears larger and longer bunches than the *gamet*; but, like it, has too poor a juice to make good wine. It is even inferior to the *gamet* in this respect: but it makes excellent verjuice, and fine sweet-meats. Very few, if any, of this species, should be left in a vineyard.

12. Besides these eleven most general sorts of grapes, there are many others, which, though less usually spoken of, ought to be known.

The *beaunier*, so called because it is very common and much esteemed at Beaune, is a grape which yields greatly, and has some resemblance to the *white gouais*. At Auxerre, it is called the *servinien*.

The *fromenteau* is an exquisite grape, and well known in Champagne. It is of a gray red, grows in pretty large bunches, which are very closely clustered, has a tough skin, an excellent juice, and makes the best of wine. It is to this grape that the famous wine of *Sillery* owes its merit and renown.

The *sauvignon* is a black grape, pretty big and long, very high flavoured, and exceedingly good. There is also a *white sauvignon*, which has the same qualities as the black: but both of them are scarce, and not much known.

The *pinquant-paul* is a very sweet white grape. It is likewise called the *bec-d'oiseau*, or *bird's bill*, and in Italy, *pizutelli*, *pointed*, because its berry, which



which is large and very long, is pointed at each end.

There is also the *purple pizutelli*, otherwise called *dent-de-loup*, or *wolf's tooth*, which has likewise a long berry, but less pointed. It is one of the plumpest and most beautiful of grapes, and yields a pretty good juice, which will keep for a long time.

The grape which the French call the *gland*, because it is shaped like an acorn, is of a deep yellow colour, very sweet and keeps well.

The *blanquette de limons*, is a white grage, transparent as glass. It's bunch is long and pretty big: it yields greatly, and it's juice is very sweet and delicious.

The *white robe*, and the *black robe*, yield also plentifully. Their bunches are thick and long, their berries small, and very close together; but, being a species of the small *bourdelais*, they do not ripen easily.

The *Alicant vine*, commonly called the *great black Spanish*, bears bunches of very large berries, which are good to eat, and still better to make the wine so vaunted in Spain; usually called *Tent*, in this country.

The berries of the *African* grape are as big as plums, and the bunches of them are proportionably large. These berries are rather long than round, and somewhat flat towards the point. The wood of this vine is very thick, and it's leaf, very large. The assistance of a wall, and a great deal of sun, are necessary to ripen this fruit thoroughly.

The *morocco*, or *barbarou*, is a large purple grape, the bunches of which are also of an extraordinary size. The berries are big, round, and hard, the wood reddish, and the leaf streaked with red. Some vines of this species yield amazingly, and blossom three times a year.

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The *Damascus* grape is likewise excellent to eat; it's bunches are very big and long, it's berry very large, long, and of an amber colour. It has but one stone, and is very apt to shed it's blossoms; for which reason it should be pruned long. There is a white sort, and a red sort, of this grape.

The *Italian* grape, otherwise called *pergoleze*, is of two sorts, viz. the *white* and the *purple*. It's bunches are large, and the berries long and loose set; but they require a considerable degree of heat to ripen them.

The *Mantuan* vine yields a very early fruit; for it ripens in the beginning of August. It's bunch is pretty large, and it does not shed it's blossoms: the berries too are pretty big, rather long than round: they are of a fine rich amber colour, and contain a very vinous juice.

The *Austrian* vine, or *cioutat*, has a leaf divided like that of parsley: it's fruit is white, sweet, yeilds well, and resembles the *chasselas*; but it's juice is not vinous.

The *Swiss* grape is rather curious than good. It's bunches are thick and long, and their berries are variegated with black and white, sometimes in such manner that one half of a berry is of one of these colours, and the other half of the other.

A short recapitulation of the abovementioned different sorts of grapes, will at once shew what each of them is fittest to be planted for.

#### *Grapes proper for the Garden.*

The *cioutat*; the *black* and the *white chasselas*; the *white*, the *black*, the *red*, the *long*, and the *musky muscat*, with the early *Orleans muscat*, commonly called the *gennetin*; the *corinth*, small or large, red or purple; the *malmsy*, gray or red; the *Italian*, the *African*, the *Damascus*, the *Morocco*, the *apricot*, the *white robe*, the *melié*, especially the *white*; and the *Bourdelaïs*.

*Grapes*



*Grapes proper for the Vineyard.*

The *pineau*, or *Auvernat*, the gray *Auvernat*; the *white morillon*, and the *morillon taconné*; the *gennetin*; the *pinquant-paul*, the *beaunier*, the *tresseau*, and all the *bourquignons*; the *bourdelais*, the *Swiss*, the *Spanish black*, or *Alicant*; the *ploqué* the *sans-moireau*, or grape without stones, the *negrier*, the *fromenteau*, the *blanquette de limons*, and most of the garden grapes, especially the *melié*, the *white robe*, the *black* and the *red muscat*, and the *chasselas*. A few plants of the *gouais* may also be intermixed with them.

*Grapes proper for making Verjuice.*

The *farineau*, the *white* and the *purple gouais*, and the *white* and the *black gamet* \*.

## ARTICLE X.

*Vines fitter for some Soils, than for others.*

WHEN a vineyard is planted in a strong soil, it should consist of *morillons*, otherwise called *white* and *black pineaus*; but there should be more of the latter than of the former, and they should be intermixed with *tresseaus*, otherwise called *Burgundy grapes*.

\* It is proper to observe, that if the grapes of which verjuice is to be made are too ripe when they are gathered, their juice turns to water; and if they are gathered when too green, it is often productive of bad consequences: there is therefore a proper medium between these two extremes; and that medium depends chiefly on the year's being forward or backward. Those who are used to gather grapes for this purpose, know exactly when they are fit to be cut off the vines.

When large quantities of this liquor are made, the grapes are squeezed in a press; such as is used for making oil. The whole art of preserving it for many years, consists in keeping the vessel closely stopped, and putting into it a little salt. Two pounds of salt are sufficient for a hoghead of verjuice. *Maison rustique, Part. 4. Liv. 4. c. 2.*

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The *pineau* does not attain to it's full perfection in strong lands, though the season be never so hot: for, notwithstanding all the help that can be given it in such a soil, it still wants that undefinable *somewhat*, without which no grape can yield a delicate wine: whether it be, that, in imbibing it's nourishment from the earth, it's juices retain a portion of the moisture which is natural to that earth, and which blunts the spirits of the wine; or that, as experience has shewn in very many cases, though the heat be as great as possible, a strong soil does not yield to the grape that sort of juice which acquires a fine high flavour, and a racy vinous quality, by fermentation. — Thus, it is known from facts, that the *Madeira* grape planted in a rich valley, no longer yields the same wine it does on it's native rock. — Yet the *pineau* is the only grape that should be planted in a strong land; because it ripens earlier than others, and always yields a sure crop.

If some plants of the *treffeau*, whose fruit never ripens easily, are mixed with the *pineaus*, it is, say the authors of the *Maison rustique* <sup>x</sup>, because our forefathers, having found by experience that the *pineaus* cannot of themselves yield in such a soil, wine which has a sufficient body to keep long, judged it necessary to add these *treffeaus*, which, though they ripen very slowly, never fail to yield that sort of wine which, without being spirituous, is, on the contrary, thick and heavy, which is the state it should be in when produced by strong land, in order to it's becoming good.

In a sandy soil, whether it be coarse or light, *pineaus*, and especially the white sort, are the vines most proper for planting. The *meunier*, or *miller* grape, delights in light sands; and coarse sands

<sup>x</sup> *Tom. II. Part. 3. Liv. 6. c. 1.*



agree with the *meliés*, otherwise called *melon* grapes, whether these be white, black, or green. In the district of Auxerre, these sands, though naturally warmer than the strongest land, do not, for all that, yield equally good wine: (these strong lands are here supposed to be such as were before advised, and their exposition good.) This is what experience teaches us daily with regard to sands, which, furnishing no rich nutriment to the vine, yield only grapes whose juice is flat and insipid, and not so sugary as those of strong lands.

To these *pineaus* are therefore joined the *meliés*, as before said. The white *melié* is a good grape, and yields greatly: the black is less so. These sorts of grapes become excellent (so far as their nature permits) in these sands, which, being much warmer than they are substantial, suit the nature of the *meliés*, which require a great heat to ripen them. These grapes yield a wine which is not apt to turn yellow.

Upwards of two thirds of the vines planted in such sands, in France, are those of white grapes; because it is the custom of those places to make more white wine than red.

A reasonable proportion of the *tresseau* grape should always be planted with the others in sandy soils: not that it ever attains to perfection there; but that, by mixing it with those other grapes, whose juice acquires only a moderate sweetness in such ground, they may be enabled to yield wine which has a good body.

As to stony lands, those which abound in blackish and large stones, and of which the earth is reddish and somewhat moist, must be treated in the same manner as strong soils.

Those which have smaller and white stones, and of which the earth is less red, are better than the former. Besides the white and the black *pineaus*,  
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and a small number of *tresseaus*, these lands are planted with the *beaunier*; and all these grapes do well on them.

Stony land whose soil is yellowish, and where the stones are yet much less than the preceeding, are still better than them for the last mentioned sorts of grapes: for these do so well in a soil of this kind, that they always yield there a wine which is at least pleasant. They may be intermixed here with a few plants of *muscats* and of *chasselas*: for these will acquire maturity enough to be of service to the others, and will help to make their wine keep the longer.

Stony lands, which have otherwise a mellow and good soil, yield the best and finest flavoured wine when they are planted with *pineaus*; and in this case the number of the white grapes of this species should greatly exceed that of the black. Those from which the grayish wine, commonly called *partridge's eye*, is desired, should be planted chiefly with *serviniens*, and here and there a few *muscats* and *chasselas*; but no *tresseaus*.

When such lands as these are intended for red wines, they should be planted with more black *pineaus* than white, with some *serviniens*, and with a few *tresseaus*. These will yield a strong and mellow wine.

I cannot close the subject of the culture of the vine better, or in a more instructive manner, than with the following experiments, for which we are indebted to two gentlemen, of whose superior understanding in matters of husbandry, as well as of their indefatigable zeal for the welfare of mankind, we have already seen repeated proofs in several parts of this work.



## ARTICLE XI.

## EXPERIMENTS ON THE CULTURE OF THE VINE

*Extract of a Letter from M. Rouffel in Brie, to M. Du Hamel, written in the year 1755<sup>a</sup>.*

“**I** Have begun to try the new husbandry upon upon the vine. It is hard to pay at least 120 livres (five guineas) a year, for dressing an arpent (about an acre and one fifth) of vineyard, to have only our poor Brie wine; especially when the vines are entirely frozen, as they were last year, or laid bare to the very wood, by hail, as was the case in August last. I am therefore trying to find out a way to manage vines, without being at the expence of dressing, or propping them, and by which they may be less exposed to the injuries of the weather and less liable to be plundered by thieves. To this end, I pitched upon a spot of ground, about half an arpent in extent, which had formerly been a vineyard, but was grubbed up many years ago. I planted on it 400 poplars, six feet asunder, in a quincunx form. As the roots of this tree are few and small, I thought that distance might be sufficient. At the foot of each of these trees, I planted two vine cuttings, one on each side. The alleys are plowed, in order to their being sown alternately, with corn, or pulse, such as lentils, beans, barley, oats, &c. the produce of which pays the expence of plowing. While the three feet on one side of the tree are sown, the three feet on the other side are plowed, at proper times and seasons; by which means, both sides of the

<sup>a</sup> *Culture des Terres, Tom.V. c. 1.*

tree, and consequently both the vines, receive in turns the benefit of the stirring of the ground. All my plants have taken well. I intend to let the vines run up the trees, without doing any thing to them; and shall wait with patience the event of their produce, which, be it more or less, will be so much clear gain, as it will not have cost me any thing. This method was immediately approved of by the country people hereabouts, several of whom are now following my example. What helped to give them this good opinion of it, so suddenly, was, the example of a vine, which chanced to grow a league from hence, in the middle of a field, at the foot of a pear tree, and which never is either pruned or cultivated. Last year, when all the vines of this country were so damaged by the frost, as not to produce any fruit at all; this vine escaped unhurt, and bore as many grapes as yielded a barrel of wine. If the future produce of my vineyard, which contains 800 vines, were to be estimated on this footing, it would amount to 800 barrels of wine every year. But as no one can be so absurd as to make such a calculation; so, on the other hand, I believe none will deny but that my vines, producing only the two hundredth part of that proportion, will yield me four barrels of wine, which will not have stood me in the least extraordinary charge. And even supposing them not to yield me any thing, still I shall lose nothing, because they will have cost me nothing. The 400 poplars, which do not stand me in above a penny apiece, (being planted only by slips, without making or digging either holes or trenches for them,) cannot fail, in a soil that is quite fit for them, to be worth, twenty-five years hence, 10 livres (8 s. 9d) apiece, or 4000 livres (175 l. 4 s.) the whole; which will be an excellent



payment for the ground they will have taken up. I do not, however, mean to extend this method to all my vineyards. In most of them, the soil, though fit for the vine, is too dry and stony for the poplar. In Italy, vines are frequently planted at the foot of mulberry and other trees. The only thing necessary in that case, is, to make the alleys of a breadth proportioned to the shade of the trees."

*Experiment on the Vine, cultivated according to the Principles of the New Husbandry, with remarks thereupon, by M. de Chateauvieux<sup>b</sup>.*

"WHEN I began to reflect attentively on the principles of the new husbandry, I soon perceived that it might prove a means of perfecting the culture of our vineyards, as well as that of our other lands.

"I was the more readily induced to turn my thoughts towards that important branch of agriculture, as it seemed to me to have been too much neglected for a long time. I plainly saw, that our methods of cultivating the vine were, in general, not only defective, but badly executed, and that, in the common way of planting vineyards, the produce could not be proportioned to the great expence.

"I shall not at present enter into a detail of the principles and motives of my new scheme for the culture of the vine: that task would be too long for this narrative: and I should likewise be glad first to see the advantages of my method confirmed by a series of experiments repeated for several years together. My different operations, and first success, are all that I shall mention now.

<sup>b</sup> DUHAMEL, *Culture des Terres*, Tom. V. c 5. p. 548.

"Every

“ Every country has in the culture of the vine, some practice or other peculiar to itself, and which is thought essential there, though it be rejected in other places. All agree in pruning the vine, and in stirring the earth round it: but neither of these operations is performed in the same manner every where.

“ For the better understanding of my new culture, it is necessary that I should give an idea of the manner in which our vineyards are laid out and planted. Their exposition is generally to the East or South, on a good deep soil, which has a gentle declivity, or on the side of a hill. The whole surface of the ground is planted without order or symmetry; so that the vines are, almost always, either too close together, or too far asunder: very few are at proper distances. As the old vines decay and perish, the chasms are filled up by layers from the next neighbouring vines. This is the general disposition of our vineyards, from which great inconveniences must necessarily arise: but I shall not enter into that detail.

“ With regard to the culture of the vine, it is sufficient, for my present purpose, to observe, that the whole of that labour is now performed by hand, which renders it very expensive. I say nothing of the manner in which it is executed; that part having appeared to me so very defective, that I have been obliged to alter and correct it in every point.

“ By this short preamble it may easily be seen, that, in order to improve the culture of the vine, and bring it to greater perfection, it was necessary that I should attend chiefly to the three following things. 1. To dispose the vines in a better manner, by planting them in strait lines, and at equal distances from each other. 2. To contrive that disposition so as to lessen the present expence



of culture, by using a plough to stir the ground in one part of the vineyard, whilst the other should continue to be stirred with the spade. 3. To execute the several cultures of the vine, in such manner as to make them promote it's vegetation more than they do in any of the common methods.

“ I shall treat each of these articles separately.

“ I. *Of the disposition of the Vines in the vineyard.*

“ **T**HE disposition which seemed to me the most agreeable to the principles of the new husbandry, by which I was guided, was to lay the vineyard out in beds, as we do fields for corn, observing to leave an alley between every two beds, and making each bed five feet wide, in order to plant it with three rows of vines, which, by that means, would be 30 inches asunder, and the vines at the same distance from each other in the rows.

“ As to the alleys, I thought it would be right to make them also five feet wide: and what I shall say hereafter will shew, that about that breadth is necessary.

“ However, as that disposition might not be the best, I tried others on small spots of ground, by planting the vines at other distances. Some were set in single rows three feet and an half asunder; others in double rows, and in beds, with alleys of three feet and an half between them. These plantations were made in the spring of 1753.

“ But as I could not expect to see the event of these trials, till a considerable time after making them, eight or ten years, at least, being requisite to shew what the success would be, when the vines should be come to their full strength and bearing; I considered at the same time, by what means I  
might

might abridge an experiment which was to be of so long duration.

“ To that end, I formed a bed of vines in a vineyard planted 24 years before. The vineyard was good, and yielded plentiful crops. I made my bed five feet wide, and planted it by laying down stocks of the old vines, to make the two outward rows, leaving two feet and an half distance from one layer to another. The old vines, which happened to be pretty well situated, formed the middle row. The remainder of the bed, which is 240 feet long, was planted with layers.

“ An alley, five feet wide, was made on one side of this bed, by pulling up the old vines within that distance. Some of these which were left, served to form a row of vines, ready against the making of a second bed parallel to the first. It is plain, that the making of a bed in this manner, requires a breadth of ten feet, *viz.* five feet for the vines, and five feet for the alley. This bed was thus made in November 1752.

“ After I had seen the crop which it produced in 1754, I no longer hesitated to extend this experiment: and accordingly, in November of that year, I made three other beds, like the former, and close to it.

“ I not only made no doubt but that the vines, being so disposed, and having an equal quantity of earth to draw their nourishment from, would thrive better than they do in our common method of cultivating them; but I likewise hoped that their being exposed on all sides to the influences of the sun and air, by means of the alleys, would facilitate their vegetation, and hasten the ripening of the grapes.



*“ II. Of the importance of lessening the expence of culture, by the new disposition of the vines.*

*“ THIS article will be of no great consequence to those who are already used to cultivate their vineyards with the horse-hoe : I write it for those only who are not acquainted with that practice.*

*“ The manner in which I propose distributing the vines, shews at once the possibility and facility of giving the alleys every necessary culture, with the same plough and the same cultivator as we use for the alleys of our corn fields. I have not found the least difficulty in the execution of this practice.*

*“ The ground thus cultivated in the alleys, will be about a third part of the whole : the remaining two thirds will continue to be cultivated by hand, as usual ; and the expence will be considerably diminished, by the dispatch with which the plough, or cultivator, will perform it's part.*

*“ The plough may be brought as near the vines as one pleases, provided care be taken not to damage them. An expert husbandman will easily know how to manage in that respect.*

*“ Another diminution of the expence attending the common culture of vineyards is, that as, by the method which I propose, the number of vines will be fewer, they will of course require less labour, and therefore less cost ; and the vine-dressers, meeting with no hinderances or obstructions between the vines planted regularly in rows, will do more work in a day, and that much better, than in the old way. There will also be less occasion for many things necessary to the vine, such as propping, tying up, dunging, &c. Consequently this new culture will prove a considerable saving.*

*“ It*

“ It is well known how much vines are hurt when too great a quantity of water is retained in the ground. It chills them too much, their juices become less exalted, numbers of weeds spring up, &c. These inconveniences will be remedied in a great measure, by means of the alleys, by cutting with the plough, as I have done, towards the beginning of winter, a furrow along each side of the bed. The water will drain off into that furrow, and the bed will retain only the degree of moisture necessary for the vines.

“ III. *Of the means of rendering the culture of the vine more beneficial to the plant and to it's fruit.*

“ I Shall speak only of the two principal parts of the culture of the vine, viz. the pruning of it, and the stirring of the ground; and the time when each of these ought to be performed.

“ Before I began to execute the alterations I had thoughts of making in this culture, I had endeavoured to make myself so far master of it, as to be the less in danger of miscarrying in my experiment.

“ The custom of this country is, to prune the vine during and after winter; frequently beginning that work about the end of January. I always thought that a wrong season; and judged that it would be much better to prune the vine before winter, immediately after the vintage is ended. Experience has since shewed me that I was right.

“ In November 1750, I pruned above fifty vines with my own hands: none of them suffered in the least by the winter's frost: they made strong and vigorous shoots, and produced a greater quantity of grapes than any of the neighbouring vines,



“The next year, and in the same month, I pruned the same vines again. This pruning had the same success as the year before. Encouraged by this repeated experience, I determined to make the bed before mentioned, in my old vineyard. The vines have continued to be pruned before winter, always with success, and without any sort of inconvenience.

“Satisfied with these first trials, I thought I might safely venture to extend the same practice to a larger extent of ground. I had about three acres of vines, which had produced very little wood for two years past. Their branches were so poor and slender, that they would scarce bear laying down: in short the vineyard perished daily. I conceived hopes of recovering it by means of this pruning. Accordingly, I pruned it in November 1754; and in 1755, the vines produced stronger and longer shoots. As the branches would then bear laying down, I began to replenish part of the vacant places. By this means, my vineyard was replanted with young vines, and quite renewed, only by altering the time of pruning.

“This last pruning underwent a severe trial, from the excessive hard frosts of the winter of 1755: yet, intense as the cold was, my plants bore it, without being hurt at all. I then looked upon it as certain, that the vine might be pruned before winter, without any danger from the inclemency of that season.

“It was absolutely necessary that the vine should bear pruning at that time, in order to enable me to perform the other cultures in their proper and most favourable seasons.

“That the vine may be benefited as much as possible by every stirring of the earth about its roots, these stirrings ought certainly to be performed

formed at the times when they may be most likely to excite the greatest vegetation. Let us see whether the common practice answers that end. The usual time of beginning to dress the vineyard is in the spring, immediately after pruning the vines. Three dressings are judged sufficient; and it is generally thought, that the last should be finished by midsummer. The plants are then left to shift for themselves, till the time of vintage, which is upwards of three months after. During this time, quantities of weeds generally shoot up, which shade the vines, and hinder the grapes from ripening as they ought. Careful husbandmen pull them up: but the greater part are unwilling to take that trouble.

“In the common way of cultivating the vine, the earth is first stirred when the buds are just ready to come out, and even after they are come out; a time always extremely critical, because the uncertainty of the season exposes the buds to several dangers, which are increased by that stirring of the earth, from whence many exhalations, oftentimes very pernicious, proceed at this season. Would it not be much better to let the vineyard rest while the vine is budding?

“The last stirring, which is given about midsummer, is too long before the vintage, and therefore is almost always followed by great quantities of weeds. Might not this last culture be performed later?

“I have experienced that these inconveniences may be avoided, without falling into others. To this end, after the vine has been pruned, before winter, let the earth be first stirred in that season: the second stirring, which would otherwise be immediately after winter, may then be deferred till towards the end of May: and the third stirring  
may



may be given in the beginning of August, or about the end of July.

“ This has been my method of cultivating my vines, ever since their being planted in beds. The beds are dug by hand, and the alleys are stirred with the plough or the cultivator.

“ The first stirring before winter produces the same effect on the vineyards, as it does on our beds of corn. The water is drained off, and the winter's frosts penetrate the earth, divide it, and keep it loose and light.

“ It remains in this state till towards the end of May, when it receives the first stirring after winter: and, to have a more certain rule to go by, the second stirring should not be given till after the props have been stuck, the vines have budded, and the shoots have been tied up to the props. This stirring may be given, either a little sooner, or a little later, than is mentioned above, according to the season. Sometimes one may be obliged to hasten it, if the ground is greatly burdened with weeds: but at whatever time it be performed near the end of May, it is certain that the vine will then have made great shoots, and that without having been disturbed by any stirring of the earth during the time of it's tender vegetation. As I have tried this culture in hot and very dry years, I have seen that the earth has not grown hard, but has retained the necessary degree of moisture, so as to be stirred with the greatest ease.

“ The third stirring, which is the second after winter, being deferred till towards the end of August, or at least till the end of July; weeds have not time to grow in any quantity between that and the season of the vintage: and what will render it still more beneficial, is, that this is the time when the grapes fill most, and are drawing towards a state of maturity.

“ I may

“ I may perhaps be thought not to enlarge enough on so important a subject as this is. It will, I confess, require being treated more fully hereafter : but in the mean time I beg the reader to consider, that I am now relating only the success of my first trials.

“ *Good effects of this culiure proved by the produce of a bed of vines 240 feet long, planted in 1752.*

“ **I** Observed, in the beginning of this account, that every culture of the vine is performed with much greater ease and expedition in vineyards laid out in beds, than in those which are planted all over ; but at random. The very situation of the vines planted regularly in beds, is sufficient to shew with what ease every thing that they require may be done, and that they must, of course, be well cultivated in every respect.

“ In the next place, the pruning of the vine, and the first stirring of the earth before winter, are done at a time when the business of the field is over, and husbandmen are, in some measure, un-occupied. That time, which would otherwise be in a manner lost, may now be employed to very great advantage; and in consequence of their being advanced in their work before the coming on of winter, instead of being over-loaded in the spring, by a multitude of things to be done at that time, they will have ample leisure to attend properly, and without being hurried, to every branch of culture that a farm requires.

“ The effect of our culture has been extremely visible. The new vines have grown so prodigiously, that they now greatly surpass those of the old vineyard, which they were part of : the shoots too are thicker and longer, and the bunches of grapes bigger and more numerous.

“ When



“ When I first began to apply the principles of the new husbandry to the culture of the vine, I hoped indeed that the great fruitfulness of a smaller number of plants, might compensate for the loss of those I was obliged to retrench : but I was agreeably surprised to find all the vines of my bed loaded with an equal quantity of grapes.

“ Though my conjecture was founded on principles which I knew to be true, I was still farther confirmed in my opinion by an observation I had made, that, even in our best vineyards, there are always great numbers of vines which absolutely bear no fruit at all, and many others which produce but very little ; so that it is not on the great number of plants that the great produce of the vineyard depends, but on the goodness of those plants.

“ Accordingly I concluded that I ought not to look upon my having taken up some vines in order to form the alley, as a loss, provided those in the bed were enabled by good culture to yield their utmost productions. The event shewed that I was right.

“ I likewise judged, that the grapes would ripen more perfectly in this new way, than in the old : and in that too I was not mistaken ; for they were much higher flavoured, and made far better wine.

“ Besides these advantages, this culture preserved my vines from a very bad accident, which happens frequently, especially when the autumn is rainy : I mean, the rotting of the grapes. In our common vineyards, the grapes ripen, smothered beneath that quantity of leaves with which the vines are loaded, and surrounded by numbers of weeds, which often grow higher than the vines themselves. Add to this, that the air around them is filled with various exhalations from the earth, which, for want of a free circulation, remain suspended about the plants. These causes cannot  
but

but make the grapes rot, and the wine that is made of them, must be greatly inferior to what it would otherwise be.

“ Our vines in beds, being much less, if at all, liable to any of these accidents, will have the advantage of preserving their grapes sound and without rottenness, till they are perfectly ripe. This I have already experienced, at a time when above half the grapes of my old vineyard were absolutely rotten.

“ Notwithstanding all the advantages of this new method, which, I may say, I have only glanced at; they would probably not be regarded, if they were not attended with greater fruitfulness than is obtained in the common way. I shall therefore shew, that the produce of my young vines was very considerable, and greatly superior to that of my old vineyard.

“ My bed, as I observed before, was formed in November 1752; and the two outward rows consisted, in a great measure, of young layers, which not being old enough in 1753, to bear much fruit, I could not expect any great matter from them that year. However, they bore as much as could reasonably be desired. A violent storm of hail which fell in June, left scarce any thing to be gathered in all our other vineyards.

“ The year 1754 produced, in general, but little wine. The young plants of my bed, being then only in their second year, were too weak to distinguish themselves by any extraordinary quantity of fruit; though their vigour gave great hopes for future years. However, even in this, they were loaded with so many and so large bunches of grapes, that they yielded rather more wine than the old vines which were next them.

“ The year 1755 was one of the best years for wine, that has been known for a long time. The  
quantity



quantity was plentiful, and the quality exceeding good. The youngest plants of my bed, which were only in their third year, seemed no way inferior to the old vines cultivated in the common way.

“ This bed, 240 feet long, and ten feet wide, including the alley, yielded 336 pints of wine, Paris measure (84 English gallons), which was after the rate of two-fifths more than I had from my old vineyard; or to explain myself still better, if my whole vineyard had been laid out in beds, it would have yielded five barrels of wine, for every three that it did yield.

“ Twenty beds of the size of that we are speaking of, would make about an arpent \*; and supposing them all to produce alike, they would, after the rate of this, yield 6720 Paris pints (1680 English gallons), or 28 hogheads; which, in this country (the territory of Geneva,) is a prodigious quantity; such as no vineyard here has ever yet produced †.

“ The vintage of 1756 was neither plentiful nor good. I therefore did not make any comparison; but remained satisfied with observing in general, that my bed yielded at least as much as the old vineyard.”

\* The arpent is to our acre, nearly as 51 are to 43.

† Varro says, that every *jugerum* of vines in Italy, yielded six hundred urns of wine: according to which proportion Dr. Arbuthnot calculates, that our acre should yield fifty-five hogheads, and a little more. This, as well as the anecdote before mentioned, of P. Veterensis's portioning out his two daughters, shews to what vast perfection the Romans had brought the culture of the vine; as, indeed, they did every other branch of agriculture.

## S E C T. VI.

## OF THE CULTURE OF OLIVE TREES.

THERE cannot be the least doubt but that Olives may be raised in several of the warm parts of the British Empire in America, such, for instance, as South Carolina, Georgia, and Florida, as well, and probably as good, as any that grow in the South of France, Spain, or Italy; nor can it be questioned but that this product might then become a very considerable branch of trade to those our valuable possessions. The premiums nobly offered by our truly public spirited Society for the Encouragement of Arts, Manufactures, and Commerce, both for promoting this important part of husbandry, and for the cultivation of vines, will surely have the desired laudable effect, of exciting a due attention to these beneficial articles of commerce\*.

The

\* Among three hundred and seventy five premiums, of gold medals, silver medals, or sums of money, for objects tending to promote the general welfare of mankind; this most excellent Society, in the list thereof published April 13th, 1763, proposes to bestow the following; viz.

“ Prem. 325. A premium of one hundred pounds will be given for the greatest number, not less than five hundred plants, of Olive trees, of the same species as those from which the best *Italian* oil is produced, properly planted, and effectually fenced, secured and cultivated within any of the *British* colonies upon the continent of *North America*, to the Southward of the river *Delaware*, considered as one district, between the twenty fifth of April 1763, and the 26th of April 1765.

“ 326. And fifty pounds for the next greatest quantity, not less than two hundred plants.

“ 327. A premium of three hundred pounds will be given to that person who shall, on the first of September 1767, have  
or



The Olive tree will grow in almost any soil, provided the situation be very warm, with a full exposure

or be possessed of a vineyard or plantation in any of the colonies upon the continent of *North America*, *Southward* of the river *Delawar*, consisting of the greatest number of vines, (not less than fifty), actually producing the true *Malaga* grape, from which the best Raisins are made.

“ 328. And one hundred pounds for a like plantation or vineyard, consisting of not less than twenty-five plants, producing the said grapes.

“ 329, 330. The same premiums for Vines for Raisins will be continued to the year 1770, with the following additional clause, *viz.*

“ It will be expected that the claimants for the above premiums, should at the time of making the claim, produce a quantity, (not less than six pounds) of Raisins, certified to have been actually produced from Vines for which the premium is claimed.

“ 331. A premium of two hundred pounds will be given for the greatest number (not less than five hundred) of the plants of the Vines, which produce those sorts of Wines now consumed in *Great Britain*, which shall have been properly planted, and effectually fenced, secured and cultivated within any of the *British* colonies upon the continent of *North America*, to the *Northward* of the river *Delawar*, considered as one district, between the first of April 1762, and the first of April 1767.

“ 332. And fifty pounds for the next greatest quantity, not less than an hundred plants.

“ 333, 334. The like premiums will be given, upon the same conditions, for the greatest number of Vines in like manner, planted and cultivated as above, within the same time, in any of the *British* colonies on the continent of *North America*, to the *Southward* of the river *Delawar*, considered as one district.

“ 335, 336. And the same premiums for the greatest quantity in like manner planted and cultivated within the same time, in the *Bermuda* islands.

“ *N. B.* The person who shall be intitled to the premium for making five Tons of Wine, as published in the list of premiums in 1761, shall not be intitled to these premiums.

(\* \* The article here referred to runs thus. “ As the producing of Wines in our *American* colonies will be of great service to those colonies, and also to this kingdom, it is proposed to give the Planter, in any of our said colonies, who shall first produce (within seven years from the fifth day of April 1758)

from

exposure to the South or East, especially on the side of a hill, or other rising ground; for it never bears well in a flat, or valley. It grows to the largest size when planted in rich moist ground: but its fruit is best, either for eating, or for making oil, when produced on a poorer soil. That which grows on chalky land mixed with coarse sand, and lying upon a bed of gravel, is thought to yield the finest and best keeping oil: but a watery, oozy, or quite chalky soil, is not fit for the olive.

This tree seldom rises higher than from twenty to thirty feet; nor is it often seen with a single stem, but generally with two or three, which rise from the same root, and put out from their sides, for almost their whole length, branches which are covered with gray bark, and garnished with stiff leaves about two inches and an half long, and an inch broad in the middle, gradually diminishing to

from his own plantation, five Tons of white or red wine, made of grapes, the produce of the colonies only, and such as in the opinion of competent judges appointed by the Society in *London* shall be deemed deserving the reward, not less than one Ton thereof to be imported at *London*; one hundred pounds.

“ A certificate under the hands of two or more Justices of the Peace residing in the county, or of the Minister and Churchwardens of the parish where such Wine was made, setting forth that the Wine was grown and made at the place mentioned therein, and that the remainder of the wine is equally good with that imported, and such certificate backed or countersigned by the governor or chief magistrate of the colony, will be expected by the Society at the time the premium is claimed.

“ 337, 338. The like premiums will be given, upon the same conditions, for the greatest number of Vines, which produce those sorts of Wines now consumed in *Great Britain*, which shall have been properly planted, and effectually fenced, secured and cultivated within any of the *British* colonies upon the continent of *North America*, to the *Southward* of the river *Delaware*, or in the *Bermuda* islands, each to be considered as one district, between the first of April 1767, and the first of April 1768.”



both ends. They stand in opposite pairs, and are of a lively green on their upper side, and hoary on the under. The flowers, which are produced in small bunches from the wings of the leaves, are small, white, and have short tubes, spreading open at the top; and these are succeeded by oval fruit, which ripens in the autumn.

The sorts of olives which are chiefly cultivated in Provence and Languedoc are distinguished by the appellations of, the *cormeau*, the *ampoulan*, and the *moureau*: but these are only variations of the *Olea foliis lineari-lanceolatis subtus incanis*, or Olive with linear spear-shaped leaves, hoary on their under side; which is Tournefort's *Olea fructu longo minori*<sup>a</sup>, or Olive with a smaller oblong fruit. The Spanish olive is M. de Tournefort's *Olea fructu maximo*<sup>b</sup>, or Olive with the largest fruit. The Lucca, and other Italian olives, produce the smallest fruit of all; and these, which have likewise narrower leaves than either of the former sorts, are also the most hardy. The African olive, of which Dr. Boerhaave<sup>c</sup> distinguishes two sorts, viz. the *Olea Afra, folio longo, lato, supra atroviridi splendente, infra palidè viridi*, or African olive with a long, broad, shining leaf, of a blackish green above, and pale on it's under side; and the *Olea Afra, folio buxi crasso atroviridi, lucido, cortice albo scabro*, or African olive, with a thick dark coloured shining box leaf, and a rough white bark, commonly called box-leaved Olive, must certainly require a very great degree of heat; for I do not find that it has been ripened in any country but that of it's native growth, and at the Cape of Good Hope: neither do I meet with any account of it's qualities, either for eating, or for making of oil.

<sup>a</sup> *Inst. R. H.* 599.

<sup>b</sup> *Ibid.*

<sup>c</sup> *Ind. alt.* 2. 218.

It would be at least very tedious to raise Olive trees from the stones of their fruit : but they may be easily enough propagated by layers, cuttings, or offsets from their roots.

The layers, which are formed by laying down the tender branches, in the same manner as is practised for other trees, must be allowed two years to take root, before they are cut off from the mother tree, in order to their being planted in the nursery ; for a nursery is as necessary for the raising of these, as it is for any other sort of fruit trees. This nursery should be in a free air, in land that is moderately strong, but rather light than heavy, and somewhat moist, though by no means wet or watery. It should be plowed well, and repeatedly, or rather thoroughly dug, to the depth of at least three feet, so long before the time of planting, as that it may be well mellowed by the influences of the air, &c.

The cuttings, or rather truncheons, for they should be full two inches in diameter, and not above a foot and an half long, should be taken from the straightest, roundest, and most fruitful branches of young trees, the bark of which is smooth and perfectly sound. They should be sawed off with care not to hurt the bark or any other part of them, and with eyes towards each end, to produce shoots at the one, and roots at the other. Both the cut extremities should then be smoothed with a sharp knife ; and after that the wounds have been covered with the grafting clay or cement before mentioned<sup>d</sup>, or, says Columella<sup>e</sup>, with dung mixed with ashes, these truncheons should be set in the nursery, so deep as that the upper end may be covered with four fingers depth of

<sup>d</sup> Page 213.

<sup>e</sup> *De re rustica*, Lib. V. c. 2.



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earth. Care must here be taken to place that end uppermost, which was uppermost on the tree; and in order to be sure of this, they should be marked with chalk, or some other soft substance, as soon as they are cut: for if they were put under ground inverted, it would be long before they would strike out roots, and even though they should afterwards produce strong trees, they would be for ever barren. A mark should also be stuck up on each side of the cutting thus planted, in order that the digger of the nursery may not injure it with his spade or hoe. The best way therefore is to set them in strait rows, and at regular distances from each other.

When the offsets from the roots, which are generally most numerous when the head of the tree has been hurt by frosts in the winter, are grown pretty strong, they are separated from the tree with a sharp ax, so as to preserve a few roots to them, and they are planted about two feet deep in the ground. This is the most usual method of propagating the olive tree in Languedoc and Provence.

November is the most proper season for either of the above ways of planting in very warm countries; but February and March are preferable for milder climates.

The holes for planting these layers, cuttings, or offsets, but especially for the cuttings, or truncheons, should be four feet large every way, and should remain open for at least two months before the plants are set in them, in order that the earth may be the better mellowed. The mould which is to be returned into them should also be mixed with well rotted dung and wood ashes; and when the plants are set, it should be trodden down gently about them.

The young trees must remain in this nursery five years, during the first of which the ground should

should be well hoed with a hand-hoe, and in the course of the others it should be dug with a spade, or carefully horse-hoed, at least every spring and autumn, and it should be kept constantly clear from weeds. The soil should also be well manured every autumn with thoroughly rotted dung, and the plants should be watered now and then in very dry seasons. They should not be pruned at all during the two first years: in the third, two branches only should be left upon each of them; and in the fourth, the weakest of those two branches should be cut off. When the trees thus reared are five years old, they will be fit to transplant into the places where they are to remain. This is best done in November, if the ground intended for their future growth is dry, and the climate hot: but the spring, a little before their time of budding, is best for such lands as are rich and moist. The trenches, or holes, for this new planting should be laid open for a year before they are used; or if so much time cannot be allowed, let straw be burnt in them, that the heat of the fire may bring the mould to that loose and crumbling state, which it would otherwise have derived, still more effectually, from the sun, air, and frosts. Care should also be taken, that there be no wet at the bottom of them when they are planted; and the earth with which they are filled up after the trees are set (being that which was before dug out of them and spread abroad to mellow) should be mixed with well rotted dung, and trod down gently about the stems, as above directed for the nursery. The rows of these trees should be from about thirty to thirty five feet asunder in land which is rich enough to bear corn: but about twenty or twenty five feet will be enough for ground of an inferior quality, where their growth will, of course, be less luxuriant. The distances



between the trees in the rows should be in proportion; and, both here and in the nursery, they should be carefully fenced from cattle, especially whilst they are young. The trees should be taken up with as much earth as can be about their roots: the rows should be directed towards the west, that the summer breezes may have the freer passage through them; and Columella<sup>f</sup> is again of opinion here, that the trees thus transplanted should be set to the same aspect as they had in the nursery.

The olive grounds in the South of France are carefully dug, or stirred pretty deep with a hoe, twice a year, *viz.* at Midsummer and at Michaelmas. Channels are likewise cut, to convey the rain, and the fine mould which is washed down with it, from the higher parts of the ground to the stems of the trees on the lower; and in the autumn, about six pounds of goat's dung are laid around the foot of each olive tree, with sometimes a small quantity of the lees of oil of olives, to fatten the land, and kill the worms which breed in it. The roots of the olive tree are laid bare every year from October till February; all young shoots which have sprung out of the lower part of the stock are extirpated every year, unless it be an old tree which is to be renewed thereby, in which case one or two of the finest shoots are left; and all the dead wood is pared off very close.

The olive tree is not pruned till it is eight years old, nor, after that, oftener than once in eight years. This is most usually performed at the end of the winter, a little before the buds begin to swell; but I have already given my reasons for not thinking this the most proper season. However, it should be done in fine weather; and the people of

<sup>f</sup> *Ibid.*

Provence and Languedoc, who may possibly have experience on their side, and therefore I shall not pretend to contradict them, hold, that the moon should always be in the decrease when these trees are pruned. They heal the wounds made in pruning, by rubbing them with lees of oil drawn without salt, or covering them over with the substance which remains of the olives after their oil has been pressed out.

Skilful husbandmen manure their olive grounds every third year, generally with well rotted dung, whether they be, or be not, sown with corn in the intervals between the trees; which last practice Columella recommends, because, as the olive tree does not produce an equal plenty of fruit in any two successive years, the other crop will help to make amends for the deficiency, and the stirring of the ground, by plowing it, will always be of service to the trees. *He*, says that excellent judge of rural affairs, alluding to a proverbial expression which was old even in his days, *who plows his olive ground, asks fruit; he that dungs it, begs and intreats it; but he who prunes his olive trees, commands it*<sup>g</sup>. But at the same time he cautions us not to repeat this last part oftener than every eighth year, lest those which would be fruit bearing branches should be injured, or cut off.

An olive tree which thrives well, and does not produce fruit, may be made to bear by cutting off one of it's principal roots; or by laying to it's roots lees of unsalted oil, mixed with stale urine of men or swine<sup>h</sup>: but the surest way is to engraft it with a good cion of it's own kind, taken from a fruitful branch of a well bearing tree. This

<sup>g</sup> *Ibid.*

<sup>h</sup> COLUMELLA, *ubi supra*. And *Maison rustique*, Tom. I. Part 2. Liv. 4. c. 2.



is generally done in May, and the method is that of scutcheon-grafting: but no part of the stock is cut off till a year after. Then, indeed, it's head is cut off close to the graft.

In Provence, when an olive tree is decayed, and therefore condemned to be grubbed up, the following method is used in order to force it to yield a good final crop. The breadth of an inch of bark is peeled off all around it's youngest branches, and the place thus bared is covered with an equal slip of other bark taken from the branch of a young tree of the same species. The wound is then dressed in the same manner as is practised for grafting, and the branches of the old tree thus spliced in the rind yield an uncommon quantity of fruit. Nearly the same thing is done in Languedoc, by grafting old olive trees in the month of May, and then cutting the bark off circularly to the breadth of about three fingers, just above the graft, so as to lay bare the wood of the stem or branch which has been engrafted; the consequence of which is found to be, that the tree produces a double quantity of blossoms and of fruit. The trees thus forced die indeed the same year: but as this operation is not performed till they are no longer worth cultivating, it is thought best to kill them in this manner, because an extraordinary crop of fruit is obtained thereby<sup>i</sup>.

In Spain, the olive trees are not suffered to grow so high as they do in France: on the contrary, they are kept low, like shrubs, and are found then to yield the most fruit, which is also least apt to be blown off or injured by high winds, and likewise the easiest to be gathered. These trees are therefore cut low when they are pruned: for their nature is to produce either a great deal of wood, or

<sup>i</sup> *Maison rustique*, Tom. I. Part. 2. Liv. 4. c. 2.

a great deal of fruit. The Spaniards give the preference to their large olives, because they are most fleshy, and yield the greatest quantity of oil: but neither the fruit nor the oil of that country is at all comparable to the product of France or Italy.

The olive tree is long lived, and it's wood which has an agreeable smell, and is prettily veined, is esteemed by the turners.

The antients looked upon the olive as a maritime tree, and supposed that it would not thrive far from the sea: but, though it does bear the spray of the sea better than most other sorts of trees, experience has shewn that it will succeed perfectly well in any country where the air has a proper degree of heat.

The fruit of this tree is gathered by hand, either in June or July, while the olives are green, if they are intended for pickling; or in November and December, or even January, when they are thoroughly ripe, which is known by their beginning to turn to a blackish red, if they are designed for oil.

*The method of pickling of Olives.*

The method of curing the *picholines*, as they are called, which are the smallest sort of olives, but the best for eating, is thus<sup>a</sup>. After they have been gathered, they are spread abroad upon cloths, for some days, in the air, to dry; and then they are put up in barrels, and a leye made of a bushel of the ashes of burnt cuttings of vines, or of boughs of oak, and half a bushel of well sifted lime, with a proportionable quantity of water, is poured over them till they are covered. They are

<sup>a</sup> *Maison rustique*, Tom. I. Part. 2. Liv. 4. c. 2.



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well stirred about in this leye, but with great care not to bruise the fruit; and after they have soaked thus for about twelve hours, an olive is taken out and split, to see whether it's flesh separates from the stone. If it does, 'tis time to pickle the fruit.

Some people put unslaked lime into this leye, which, in that case, becomes of a red colour, and gives the olives a sharp acrid taste. To take off their bitterness entirely, for they are excessively bitter when fresh gathered from the tree, they are laid, after being taken out of the abovementioned leye, to soak in soft water, which is changed every day, till they become even flat and insipid, as they generally do in eight or nine days. When brought to this state, they are put, with their pickle, into other barrels, in which they become fit for eating in about a month. This pickle is made by dissolving in water as much salt as will render it strong enough to bear an egg, and then adding to it garden thyme, wild thyme, and a few branches of anise or fennel. The pickle must be changed every three months, or the olives will loose their taste.

Others keep their olives a long time, before they pickle them, either in small wine, or in salt and water, and many eat them when only so prepared. The small wine is better than salt and water, because the olives acquire a disagreeable taste in this last, and often grow rotten in it.

When they want to pickle, either the olives thus preserved in weak wine, or in salt and water, or such as are fresh gathered, and as yet quite green, they steep them for several days in fresh water, which they change very often, and then take them out, and put them in a leye made of water prepared with barilla, or kali, and with ashes of olive-stones calcined, or with lime. They are afterwards  
laid

laid in a brine of water and salt, which is put in those little barrels, wherein they are brought to us; and, to give them a flavour, an essence, usually composed of cloves, cinnamon, coriander, and fennel, is thrown over them. It is in the composition of this essence that the whole secret of pickling olives consists. When thus managed, they are fit for eating in seven or eight days.

In the Levant, they eat none but black and thoroughly ripe olives: after these have been dried a little in the sun, they are put into jars, and pressed closely down, with layers of salt between them; but no water.

The picholines keep longer than olives prepared in any other manner. The Spanish olives are larger and bitterer than those of Verona. The Provence and Languedoc olives are of a middle size, between the picholines and the Verona olives.

*The method of drawing, and of keeping, Oil of Olives.*

They who would have that exceedingly delicate and finely flavoured oil, which is called *virgin oil*, and of which the best comes from Grasse, Oneille\*, Aramont, Aix, and Nice, (for these are greatly superior to all the Italian oils,) grind their olives with a mill-stone as soon as they are gathered, the time for which is, as before observed, in November, December, or January, or, in other words, when their perfect maturity is denoted by their beginning to turn red. But as the newly gathered olives yield but little oil, those who prefer quantity to quality, after cleaning them, and even washing in warm water such as are foul or dirty,

\* The valley of Oneille, or Oneglia, highly commended for it's vines as well as for it's olives, borders upon the state of Genoa, and is subject to the duke of Savoy.



spread each day's gathering separately on a dry spot of ground, and let them remain there ten or twelve days, to heat and ferment; by which means a great deal of watery moisture is exhaled from them, and they are disposed the more easily to part with their oil. After this, they are either ground in a mill, or squeezed in a press. The first oil which comes from them is the best. There are who bestow upon this the appellation of *Virgin oil*: but, in fact, it is only a second oil, neither the smell nor taste of which bears any comparison with the true virgin oil.

The common oil, which is of a yet inferior quality, is drawn after this, by pouring hot water upon the marc, as it is called, or residue of the olives, and pressing it more strongly than before.

There are likewise some who, even after this, stir up the remaining marc, then pour upon it boiling water, and squeeze it as hard as possible in the press, to extract every drop of oil. But this third running is always very coarse and full of dregs.

These oils are easily separated from the water, because they swim a-top of it. The lees sink to the bottom. They are drawn off into different vessels, that they may not be mixed. Some think that wooden tubs are better for this use, than earthen pans. When the oil has settled a little in the first tub, it is poured off into others. The more it is stirred, the clearer and better tasted it will be. It keeps better in vessels made of goat-skins, than in any other<sup>b</sup>.

All the skins destined to receive the oil should be not only well cleansed and scalded, but also carefully done over with wax or gum, or covered with very pure and well diluted fine potters clay.

<sup>b</sup> *Maison rustique*, Tom. I. Part. 2. Liv. 5. c. 4.

A thin coat of white wax will prevent the oil from turning black. When the oil is poured off, the skin which contained it should be washed immediately with warm water, and wiped with a sponge; and lastly, after scalding those in which there remained any lees, these should be laid to soak for some time in running water, and then be well beaten with sticks, to force off every kind of filth.

Olives waste greatly by keeping, and therefore should be pressed as soon as possible after they are quite ripe. Great care should be taken not to suffer any smoke, lighted lamp, heat or smell which may tarnish or corrupt the oil, ever to come, or be brought into the place where the oil is made.

Many people put two pounds of salt to each bushel of olives when they press them; and they press them either in new frails or wicker baskets, or upon hurdles of wicker; according as the one or the other chances to be the custom of the country: it is immaterial which of these is used.

The olives which are intended for oil should be left upon the tree till they are even rotten ripe, in which state they have a sweetish and oily taste. Not a drop of oil can be extracted from olives which are not perfectly ripe; but only a viscous juice called, in pharmacy, *omphacion*. This is what the ancients used in lieu of real oil. It keeps well in glass or stone bottles.

New made oil generally requires thirty days for the perfect settling of its lees, and for this reason it is not drawn off till then for the last time. It should be kept in a cool, dry, and very clean place; because heat, moisture, and dirtiness are great enemies to oil.

It is pretended in warm countries, that oil never freezes, and that it is only the lees mixed with it  
which



which freeze and thereby entangle the finer parts of the oil, unless salt baked a second time and well pounded, be mixed therewith; for oil never takes any taste of salt, though ever so great a quantity thereof be put to it. It is likewise said, that it will remain always clear, if a little bag full of the leaves and bark of an olive tree pounded and mixed with salt be put into the barrel; and also that it's growing rank may be prevented, or it's rankness if it has already contracted that defect, be cured, by throwing in an equal quantity of anise, or of melted wax, of salt and of oil, mixed together. It is easily clarified when turbid, by pouring upon it hot water.

## S E C T. VII.

### OF THE CULTURE AND MANAGEMENT OF HOPS.

**T**HE best method yet laid down for the culture of Hops is delivered to the following effect, in a pamphlet drawn up, and published in the year 1733, by order of the respectable Dublin Society for the advancement of Agriculture and Manufactures.

A rich, deep, mellow, dry soil, more inclining to sand than clay, is, in general, the fittest for Hops; and, in particular, a black garden mould is excellent. Stiff clays, spewy lands, such as are apt to be overflowed by floods, hard gravels, stony grounds, very sandy ones, and such as are not at least a foot and an half deep, are altogether improper for hops.

The best situation for hop-grounds, is such as inclines to the South, or lies open to it, so that they

they may have the benefit of the sun during the greatest part of the day. It must also be open for the air to have a free passage and circulation between the plants; and it should be so sheltered to the East, North, and West, that neither the frosty winds in the spring may cut off the young sprouts, nor the more stormy ones in summer and autumn destroy the full grown hops.

The ground and situation being chosen, the next business is to prepare it for the planting. In many parts of England, when the ground is broken up for this purpose, the plough goes first, and men follow it with their spades, with which they dig one spit deep in the furrow where the plough has passed, throw up the earth thus dug, and so continue to plough and dig till the whole is done. Either this tillage, if it be well performed, or the deep plowings, cross-plowings, and harrowings, by which careful husbandmen prepare their land for corn, will fit this for being sown with turnep seeds in the end of July, or beginning of August, and if the turneps are hoed twice, so as to be left about eight inches asunder, they will yield a good crop, the weeds will be destroyed, and the ground will be rendered loose and fine. Another good plowing after the turneps are taken off, will, with the ensuing winter mellowing, render it fit for being planted with hops in the spring. The best time to begin the plowing is in October, in order that the soil may be properly prepared to receive the benefits of the winter's frosts, rains, and snows; after which, in the beginning of spring, it should be well and deeply plowed again, and well harrowed; and after another plowing in March, which will be of very great service, it should be harrowed fine, and laid as even as can be.



If the mould of the hop-ground be naturally good, and made fine by the abovementioned preparation, there will be little or no occasion to manure it the first year; but if the soil is not rich or fine enough, it will be right to bring into the hop-ground, in the spring, some fresh mould, or mould mixed with old rotten dung, or other manure suited to the nature of the land, in such quantity that there may be about half a bushel of it for each hop-hill.

When the ground is in proper readiness for planting, stretch along a strait side of the field, at fifteen or twenty feet distance from the hedge, and parallel to it, a line with knots or rags tied in it, as far asunder as you design your hills to be, and stick in the ground a sharp pointed stick at every knot, as marks for the places where the hills are to be made: continue the line in this manner the whole length of the ground, and from this first row you may mark out the rest of the field, either in squares, chequer-wise, at the intended distance of the hills, or in the quincunx form, where the hills of every row lie opposite to the middle of the first, in a triangular form.

The distance of the hills should be, in some measure, regulated by the nature and goodness of the soil: but, in every case, they should be far enough asunder to admit the hoe-plough at all times without danger to the plants: for the cultivating of hops according to the principles of the new husbandry, which have been amply explained in former parts of this work, will most certainly save a very great part of the heavy expence which necessarily attends the managing of hop-grounds in the common way, and at the same time produce the best and finest crops. If the soil be dry and shallow, six or seven feet will be a convenient distance: but if it be rich, moist, and apt to bear  
large

large hops and leaves, it may be right to allow eight or nine feet between the hills. If the hills should be found to be too far asunder, after the ground has been planted some time, and is thereby become what is commonly called an old hop-ground, that inconvenience may in some measure be remedied by enlarging the hills and increasing the number of roots and poles: and if the hills are too near, it will be necessary to lessen the quantity both of plants and of poles: for the over-poling of a hop-ground, either in number or height of the poles, is of much worse consequence than poling it too little.

The most proper season for planting hops is from the beginning of March to near the middle of April, at the time when they begin to shoot. The Kentish husbandmen approve likewise of October: but the common sorts are not to be procured then, unless it be from a ground that is to be dug up and destroyed; besides which, there is some danger of their rotting in the earth, if the winter should prove very wet.

There are several sorts (though the botanists allow but one species) of hops. The most esteemed are, the long white, the oval, and the long square garlic hop. These differ from each other in the colour and shape of their bells, or hops, in their degree of bearing, and in their time of ripening. The long white is most valued, because it is a great bearer, and produces the most beautiful hops; for the beauty of hops consists in their being of a pale bright green colour. The oval hop is beautiful, but does not yield so large a crop. There is a sort of this kind of white hop, called the early, or rath hop, which ripens a week or ten days before the common, and is therefore of advantage to those who would be first at market:



but it is tenderer than the other, and does not bear near so plentifully. The long square garlic hop is the greatest bearer, more hardy, and somewhat later ripe than the former; but, by reason of it's redness towards the stalk it is not so beautiful to the eye, and therefore is not so much esteemed, as the other sorts.

Few hop-grounds, are without some plants of a sort of hop which many call the female hop, but very erroneously, for the female hop is that which is cultivated for use, and this, which others name more properly the wild hop, is the male \*. Towards the middle of July, it puts out a great number of long loose bunches of small flowers, not at all like the true hop; and in somewhat less than a month after, that is to say, just before the true hop begins to blossom, they ripen, and, with the least motion of the wind, shed a farina, which is wasted all around, and is by some, not improbably, thought to be of use to impregnate other hops. Those who are of this opinion advise therefore to leave one or two hills of them standing in the hop-ground. But the common practice is to mark them at their first appearance, and to root them out afterwards, because they do not bear bells or hops, and as they are generally the strongest plants, sets might otherwise be taken from them, by mistake.

There is also a poor starved hop, called a wild hop, which is not judged to be a distinct sort, but a hop which has degenerated for want of culture.

\* This is the sort of hop which grows wild by the side of hedges, and upon banks, in many parts of England, and of which the young shoots are often gathered by poor people, and boiled as an esculent herb: but they must be taken very young; for otherwise they will be tough and stringy.

The several kinds and goodnefs of hops may likewise be known by the colour of the vines, binds, or stalks. The whitish binds produce the white hop, both the long and the oval: the gray or greenish binds commonly yield the large square hop; and the red binds bear the brown hop, which is the least esteemed.

The planter of hops ought to be extremely careful in the choice of his plants, or sets, particularly in regard to the kind of the hop: for it is a great trouble and loss to him when his garden proves to be a mixture of several sorts of hops, ripening at different times. He who plants the three sorts of hops before mentioned, *viz.* the early, the long white, and the square hop, in three distinct parts of his ground, will have the conveniency of picking them successively as they become ripe.

Hop-sets are cuttings from the roots or branches which grow from the main root or stock. They should be procured if possible, from grounds planted with none but the sort which is desired; and they should be from five to seven or eight inches long, with three or more joints or buds on them, all the old bind and hollow part of the set being cut off.

If it be desired to increase any particular sort of hop, by taking plants or sets from it, the superfluous binds may be laid down when the hops are tied, cutting off their tops and burying the lower end in the hill: or when the hops are dressed, all the cuttings may be saved, and laid in rows in a bed of good earth; for almost every part of them will grow, and become a good set the next spring.

Some have tried to raise hops by sowing the hop-seed; but that turns to no account, not only because the method is very tedious, but also be-



cause the hops so produced are of different kinds, and many of them wild and barren.

The largest sets should be preferred : the best are to be had out of gardens which have been well kept : they should be of the growth of the preceeding year, which is easily known by their colour, always white when they are of that age.

The ground being prepared for planting, as before directed, towards the latter end of February, or in the beginning of March, if the soil be light, or late in March if it be strong and moist, make, in the places marked out by the sticks stuck in them, holes about twelve or sixteen inches wide, and of a depth proportioned to the nature of the ground. In general, ten or twelve inches will be a sufficient depth. If the ground be shallow, and you meet with hard clay or gravel, by no means enter into this, for you would then make a basin to retain water ; but, in such case, instead of going deeper, raise up a small hill of good mould. If there is a good depth of rich mellow mould, dig the hole a foot and an half or two feet deep, and you will find the hops thrive the better ; for their tap roots naturally run downward.

If sets can be had from a hop-ground at a small distance, bring no more of them at a time than you have holes ready made for them, and plant them as soon as possible ; taking care, by keeping the roots in wet litter, to prevent their growing dry : but if the sets are procured from a great distance, lay them up in dry sand or earth, as soon as they are cut, or pack them in such manner that no air may get to them before they are planted ; and when you have brought them home, bury them in ground, and plant them as soon as the weather will permit.

When all things are ready for planting, fill up the holes with the mould before thrown out of them,



them, if it be naturally good, after having first broke it fine with a spade: but if the same earth be not rich enough, make use of fine fresh mould, or of the compost provided for this purpose. About a peck or two of this will be sufficient for each hill, as was observed before; but no new dung should be put into the hole on any account.

Then, with a dibble or setting stick, such as gardeners generally use for planting of beans, make five or six holes, the depth of your sets, one in the middle, perpendicular, and the rest round about, sloping, and meeting at the top, near the centre: put your sets therein, so that they may stand even with the surface of the ground; and then press the mould close to them, and cover them with fine mould two or three inches thick. A stick should be placed on each side of the hill, to secure it.

Some place all the sets in the middle of the hole before they fill it, spreading the lower parts of them towards the sides, and laying the tops even with the surface; then holding them tight with one hand, they throw the mould in with the other, and press it round about them. Either of these ways may do: but the first is most convenient, and most in use.

Care must be taken to plant that end of the set uppermost which grew so before, and not to leave any part of the dead stalk on the upper joint. The right end of the set may be discerned at once, by noticing the direction of it's buds or eyes.

If the sets have begun to shoot before you had time to plant them, the young buds should not by any means be covered with mould, for that would destroy them.

The ground being thus planted, all that is to be done in the following summer, is to keep the



hills and alleys clear from weeds by frequent hoeings; to dig the ground in the month of May, and to carry off all the stones, that are turned up by digging; to raise a small hill about the plants, to throw some fine mould on their roots, and in the latter end of May or beginning of June, to twist all the vines and branches together into a bunch or loose knot, and lay them thus twisted on the top of the hill. Some choose to put to each hill one or two sticks, of three or four feet long, for the vines to twist about, as more agreeable to the hop, especially if the vines be vigorous: but care must be taken to prevent the hop from bearing the first year; for that would weaken the plant.

At or about the next Michaelmas, if the weather be dry and the ground hard enough to bear the wheels of a dung cart, for otherwise you must wait till the frost has hardened it, lay on the alleys between the hills, of rotten dung, or dung mixed with earth, or other manure, which every hop-planter is supposed to provide for his winter dressing, about forty loads (the load about thirty bushels) to an acre; more or less according to the goodness of the land; and in November or December following dig or plow it in, that it may the better incorporate with the soil. Some, especially when they cannot manure their hop-grounds till the spring (but the doing of it in autumn is infinitely preferable), give their young hops a small dressing in October next after they are planted; and in so doing, they open the hill carefully, in dry weather, and cut the binds a little below the surface of the earth, then cover the tops of the plants with fine mould two or three inches thick, and lay thereon a thin coat of earth from the alleys. This defends them from the frosts in winter, and is of use at the next dressing in the spring: but in the mean while the hop-ground should

should always be dug or plowed some time in the winter: nor should this dressing in October be practised in any but the first year after planting.

Towards the latter end of February, or in the beginning of March, in the second year, when the weather is kindly, open the hills, and, with a sharp knife, cut off the shoots of the first year to within an inch of the old stock, together with all the young suckers that have sprung from the sets, and cover the stock with fine earth. To keep the knife sharp, you should have a whetstone always by you at dressing.

In the third and following years, when you dig your hop-ground in February, let the earth be taken away with a spade, or hoe, round about the hill, very near them, that you may the more conveniently come at the stock, to cut it. Then, in fair weather, towards the beginning of March, if your hops be weak, begin to dress them; but if they are strong and in heart, the middle or latter end of March will be the best time; for late dressing restrains their too early springing, which is the cause of many injuries to the hop.

The manner of performing the dressing is thus. Having, with an iron picker, cleared away all the earth out of the hills, so as to lay the stock bare to the principal roots, with a sharp knife cut away all the shoots which grew up with bines the last year, and also all the young suckers, so that none be left to run in the alleys, and weaken the hill: cut them as close as you can to the old root, if the plant be strong; to a weak hop, some part of the new shoot may be left at dressing. The tap roots, which run downward, should not be cut by any means, but only the side roots, which would otherwise incumber the ground. Great care must be taken not to hurt the old roots; but all the new ones should be cut away, and such of them as you intend to make new sets



of, to plant out, should be laid by. The old roots are red, and the young white; so that they are easily distinguished. If there happen to be wild hops in any of the hills, they must be taken up and destroyed. Some are of opinion, that even the whole hill must be grubbed up in this case, and that the spot must be new planted,

When the hop has been long planted, it is advised to cut one part of the stock lower than the other, and the following year to cut that part low which was before left the highest. This will make the plants shoot with the greater vigour.

When you have thus pruned the roots, apply some rich mould or manure to them, but make not the hills too high at first, lest you hinder the growth of the young shoots. Though the hops are springing out of the hill before you begin to dress them, you need not fear to cut off their roots.

No poultry, and especially geese, should be suffered to run in a hop-garden in the spring, because they are apt to devour the young sprouts of the hops.

If the hops are grown old, or worn out of heart, as the term is, they will be recovered, and at the same time the weeds will be destroyed, by digging round them in the beginning of winter, or at farthest in January or February, and laying rich fresh mould to their roots, in lieu of the former exhausted earth, which is then to be taken away, as deep as can be done with safety to the plants.

After the hops are dressed in the second year, the next business is to pole them. Poles of only ten or twelve feet long will do then: but in the third year, by which time they come to their full bearing state, they will require poles of full size. This, if the ground be rich, and the hop vigorous, will be from sixteen to twenty feet or even more;

or

or there will be danger of losing great part of the crop.

If the hop be weak, and the ground not rich, the poles should not be more than from fourteen to eighteen feet long, for fear of impoverishing the root; for the hop will soon run itself out of heart if over poled; so that, as was said before, there is more danger in over-poling, than in under-poling: neither can a good crop be expected from an over-poled ground, because the branches which bear the hops grow very little till the buds have over-reached the poles, which they cannot do when the pole is too long\*. Two small poles are sufficient for a hill in a young ground.

Three poles to a hill is the number generally used. If the hills are large, and distant from one another, some put four poles to them: but if they are small and near, two poles may do. In dry hungry ground the poles may stand nearer together than in a rich mellow soil, because this last will produce the largest and most haulmy plants.

Before you begin to pole, disperse your poles among the hills, three to a hill; observing to put the largest poles to those hills where the hops appear to be most vigorous: but do not begin to pole till the young shoots are ten or twelve inches

\* The author of one of the papers in the *Journal Oeconomique* differs pretty widely from the common practice both in this county and in Ireland, with regard to the proper height of the hop-poles, when he is made to say, in the *Select Essays on Commerce, Agriculture, Mines, Fisheries, and other useful subjects*, translated from that work;

“To use too long poles for hops is an error which ought to be corrected; for though the sprigs are longer, and the leaves in greater abundance, it is manifest, on the other hand, that less fruit is gathered from them. In the very best soils, therefore, the poles ought not to exceed twelve feet in height, and in worse soils, ten feet are sufficient. If the sprig mounts higher, it must be beaten down with a rod, that it may not grow higher, and that the plant may yield the more fruit.”

above



above ground, which will be about the middle of April, or fourteen days after dressing, in rich land. You will then discern where the biggest poles are required, and may continue poling till the hops are two feet or more in height: but stay not too long, lest you prejudice the hop, which will not grow well unless it has a pole or something else to climb upon; and if the binds are suffered to grow so long as to fall into the alleys, they will be apt to entangle with one another, and not so readily take to the pole afterwards.

The better to fix the poles in the hills, make holes in the ground with a square iron crow, ending in sharp point with three or four sides of the same shape as the but ends of the poles are to be; or, with a long wooden dibble faced in like manner at the point with iron. This instrument should be about three feet long, and not altogether so thick as the poles, in order that these may take the better hold. It's top should be, like that of a spade, furnished either with an eye-handle, or a crutch, that the workmen may the better force it into the ground.

The depth to which the poles should be fixed in the earth varies, according to the height of the pole, the stiffness of the ground, and the exposure of the plantation to winds. High poles, a loose soil, and a great exposure, require their being put at the greatest depth: but this general rule should be observed every where, *viz.* that the pole be fastened so deep, and so well, that it shall rather break than rise. The usual depth is about a foot and an half.

Make the holes at about a foot from the centre of the hill, or three inches from the main root, taking great care not to hurt the root of the hop, or any of it's young shoots. Make three holes in each hill, one to the East, another to the North, and a third to the West-side of it, that all the hops may the better receive the South-sun. When  
the

the holes are made, force the poles into them, driving them down with a quick motion, and place them as perpendicular as you can, or rather leaning a little outward from each other, with all their bending tops turned outward from the hill, to prevent the entangling of the vines. A leaning pole commonly bears most hops; but it is more apt to be blown down, than an upright one.

When the poles are erected, ram the earth down on each side of them with a rammer, for their greater security against the wind; but do not by any means use the rammer within-side of the poles, for fear of bruising the shoots of the hops. This rammer may be made of a piece of wood about four feet long, and three inches thick at the bottom.

Have always some spare poles in reserve to support the vines, in case any of them should break or be over-burthened; for if the hops are suffered to lie on the ground, they soon perish.

If, after some time of growing, you find a hop under-poled, you may place a taller pole near it, and bring the hop from one pole to the other.

It is advisable to place the strongest and largest poles you have, in the third or fourth outermost rows of the plantation, especially on the West and South-west sides; for they will stand best against stormy winds, and protect the inside of the hop-ground from their violence.

In dressing and forming the poles, cut about a foot or more of the but-end with three sides sloping to a point; for this triangular cutting is best to prevent their shaking in the ground. Poles of alder, birch, poplar, abele, or sally, are easiest and soonest raised, and do well in low hop-grounds; but they are brittle, apt to break, rot soon, and do not, at most, last above four years.



The bark of alder and birch is thought to help the climbing of the hop: but, being apt to crack, it soon receives and imbibes the wet, which rots the pole: for which reason, some who use them are at the trouble to strip off the bark.

The poles most generally approved and made use of in England are those of ash, which are tough and strong, and last six or seven years. Willow poles are also in esteem; but those of chefnut are the most durable.

When the poles are set as above directed, and the vines are grown two or three feet high, such of them as have not taken the poles of themselves should be guided by hand to such poles as are nearest and have fewest hops. The strongest vines should always be allotted to the tallest poles. Two strong, or three weak binds are sufficient for a pole. They should be bound about the pole at equal distances, according to the course of the sun, which they constantly follow; and should be bound with dry rushes, or woollen yarn, but not so close as to hinder their climbing up the pole; for if they they are tied too hard, they will decay and die. Two or three bindings are sufficient for each pole. In doing this, very great care should be taken not to break the young shoots, which are more tender and brittle in the morning, than in the heat of the day. Women are therefore generally employed for this business. When the chosen strongest plants of hops have begun to take to and twine round the poles, all the other weak vines should be cut off close to the hill.

The hops should be tended constantly during the months of April and May, to guide them to their poles. If the vines are not able to support and keep themselves to the poles, give them a second tying as high as you can reach; and if they

they forsake the pole after they are grown beyond the reach of your hand, a forked stick, or a ladder with a stay to the back, will be useful to tie them up again. If the vines are strong, and much over-grow the pole, some advise to strike off their heads with a long switch, in order to increase their branching below.

About Midsummer, or a little after, hops cease to run up in height, and begin to branch. To such as do not, it will be right to strike off the top with a switch, or to divert it from the pole, that it may branch the better: wherever the top or leading shoot of a vine is broken off, it will run no farther in length, but will put out branches from the next eye or knot, and these, if carefully managed, will take to the pole, and yield a much better crop than the hop would do if suffered to spend itself by running into length of growth.

Having dressed, poled, and tied your hops, as before directed, give the ground a good summer digging, some time in May, especially after rain, or at least turn up it's surface, pretty deep, with a spade, breast-plough, or hoe-plough; throw some of the fine earth on the hills, and enlarge their breadth, cutting away and burying all such superfluous roots or hops, and weeds, as appear on the hills or alleys. This will prevent the hops from being impoverished by weeds, and will also keep the hills moist. The hills must not by any means be made up and finished all at once, but by degrees, and at different times. Two or three hoeings, at least, are requisite in the course of the summer, and at each of them a little fine earth should be laid on the hills, especially after rain, the better to nourish the roots of the plants, and to keep the hills loose, open, and moist. Though it be a general rule, whenever you weed the hills, or hoe the alleys, to cast some fine mould on the hills,



hills, yet this admits of an exception; for when you find the vines very vigorous and full of sap, you must forbear giving them any more earth, because excess of nourishment will make them run too much to stalk, and thereby prevent their branching out, and consequently their bearing so many bunches of hops, as they would do if less luxuriant. You may at any time add to the sap by enriching the hills, but cannot withdraw the redundancy at pleasure.

The fewer weeds you have in your ground, the more hops you will have on your poles: therefore suffer no weeds to seed on the hop-ground.

The common size of the hills, when they are fully completed, is somewhat more than two feet broad, and about a foot and an half high. In low, moist, or rich grounds the hills should be higher and larger: but in dry, shallow, higher grounds, they are made small. The higher hills produce larger roots and binds, and better sets.

In August, when the hops begin to be in bell, pare again all the alleys clear from weeds with a hoe or sharp shovel, and throw the lightest of the earth on the tops of the hills, so as to make them as large as a bushel; but be careful not to throw on any weeds, nor to cut any of the binds with the shovel. Then too, especially if the hops are at all deficient in point of vigour, a good deep stirring of the alleys will be of singular service to them. At the same time, or rather somewhat before, women should be employed to strip the leaves from the vines to the height of two or three feet above ground, in order to give the hops the more air and sun, and to help their ripening.

Hops, in the usual way of managing them, are often so greatly checked in their growth by a very dry spring, especially at the time when they should branch most, and even when they are in blossom;  
that

that it becomes necessary to water them, either by flowing the alleys by means of a stream properly situated on a higher ground, and then paring off their surface and laying it upon the hills, to keep them moist; or even by the tedious and expensive method of bringing water on by hand, and pouring a pail full of it into a hole made with a stick, or iron crow, in the middle of each hill: and if the weather still continues dry in the summer, this must be repeated two or three different times. — Can any thing be more striking than the evidence which results from this well known fact, of the vast advantage of cultivating hops according to the principles of the horse-hoeing husbandry, in which the earth is kept constantly loose; and thereby moist, even in the very driest seasons, by deep and frequent stirring of the alleys? It highly deserves the most serious attention of every planter.

Towards the latter end of July hops begin to blossom, about the beginning of August they bell, and, in forward years, they are sometimes ripe at the end of August, or beginning of September. When they begin to change colour, or are easily pulled to pieces, when they emit a fragrant smell, and when their seeds begin to look brown and to grow hard; you may conclude that they are ripe: then pick them with all expedition; for a storm of wind will do them great mischief at this time, and hops picked green and bright, without bruising or discolouring, will sell for a third part more than those that are otherwise.

When the poles are darwn up in order to be picked, the vines around them should be cut asunder at the height of about three or four feet from the ground: for the cutting of them lower, especially while the hops are green, would occasion



so great a flowing of the sap, as would weaken and hurt the root.

If the poles stick so fast in the ground as not to be taken up without difficulty and hazard of breaking them, they should be raised by a piece of wood in the nature of a lever, having a forked piece of iron, with teeth on the inside, fastened within two feet of the end.

The most convenient way of picking them is into a long square frame of wood, called a bin. This frame is made of two poles, or pieces of wood, each nine or ten feet long and three or four inches thick, joined together at about a foot and an half from each end by two other pieces three feet long, and it is supported by four legs three feet and an half high, so that there remain in the middle of it a space six feet long, three wide, and three and an half deep. In this space is fixed a coarse linnen cloth, or hop-bag, cut open on one side, and hung hollow, either by hitching it on tenter-hooks along the inside of the frame, or by stitching it on the outside with wooden skewers, to receive the hops as they are picked. Three men or women, or four boys or girls, may stand at each side of the frame, and pick two poles at a time.

When you have raised some poles, bring them with the hops and vines on them, and lay them lengthwise upon the frame; or erect a forked prop at each end of the frame, and rest the poles thereon in order to their being picked. There is no occasion to strip the vines or haulm from off the poles before they are picked. The workmen who raises the poles generally carries them to the frames, and these being light, may be easily removed from one part of the hop-ground to another.

The ripest hops should be first picked: but if the hops appear to be equally ripe in all parts of  
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the plantation, it is best to begin to pick them on the East or North-side of the ground, the more effectually to guard against the South-west wind's breaking into the garden.

Having chosen a spot of ground which contains eleven hills, place the bin upon the hill which is in the center, and after these are picked, remove it into another spot of the same extent, and so proceed till the whole is finished:

The hops should be picked as free as possible from leaves and stalks; for these would be of greater prejudice to the sale, than any seeming advantage which might be expected from their weight. The bin should be emptied two or three times a day into a large cloth of coarse linnen, in which the hops should be immediately stitched up with skewers, and carried directly to the oast, or kiln, to be dried: for if they remain long in the bin, or cloth, they will sweat and be discoloured.

If any brown hops are met with in the picking, care should be taken to separate them from the rest, by putting them into a basket by themselves.

If the weather be very hot, or rainy, cut no more hops than may be picked in an hour: but, if it be possible, gather them in fair weather only, and when they are dry; for this precaution will save some expence of coals, and contribute to the better preservation of their colour when they are dried. No hops should be gathered when the dew is on them, for that would make them become mouldy.

When you have taken the poles from the hills, twist together the remaining ends of the binds, that they may not get among peoples legs, and hinder their work.

Before you draw the poles, observe whether the hops of one pole be entangled above with those



of another, and if they are, cut them asunder with a sharp hook fixed at the end of a long pole.

If the garden be large, it may be worth while to raise a shed in the midst of it, to shelter the pickers and the hops from the sun and rain; and to lay hops in overnight, to be picked early the next morning before the dew is off the other hops. This shed will also serve for preserving your poles in winter.

If there be either dew or rain upon the hops at the time when they must be gathered, shake the pole, and they will dry the sooner. If they are over-ripe when gathered, they will shed their seeds in which the chief strength of the hop consists; nor will they then look so green, but somewhat brown, which is a great diminution of their value. It therefore is better to pull the hops, a little before they are ripe, than to wait till they are full ripe. Four pounds of undried hops, thorough ripe, will make one pound of dry; and five pounds of hops scarcely ripe, though in their full prime, will make no more when they are dried.

There are two principal sorts of hops, *viz* the green and the brown. The former yields by much the best colour when dried, and the other is the most plentiful bearer.

Brown hops are fit for brown ale, but the hops for fine pale beer must be green; for which reason these last are most esteemed.

As fast as you pick hops, dry them on a kiln; otherwise they will change colour: but if you cannot dry them immediately, and must keep them a little while, spread them on a floor, and by that means the damage which they will receive in a day or two will not be great.

They who have five or six acres of hops, may employ ten frames at a time in picking.

If any of the rath-ripe, or early hops, which blossom and ripen a week or ten days sooner than the other sorts, happen to be intermixed in the same plantation, they should be watched carefully in order to their being gathered in time; for if they hang till they are over-ripe, they will shed their seeds, turn brown, and thereby not only become bad themselves, but spoil the sale of the others with which they are mixed. It is therefore advisable to mark at the blossoming season, the hills in which they are, in order to dig them up and replant those spots: for the trouble of pulling them up separately, when they are scattered here and there in a hop-ground, and of carrying them, sometimes a considerable way, to a convenient place, to be picked, is very great, and cannot be avoided otherwise than by either banishing them totally, which would not be quite consistent with the husbandman's profit, as they fetch a good price by their coming first to market; or, which is the best way, by planting them in a garden by themselves.

Very particular care should be taken that the hops be thoroughly and equally dried. In this lies the greatest difficulty and art in the management of them: for if they are over-dried, they will change colour, look brown, and be judged to be burnt, whereby their value will be greatly diminished; and if they be under-dried, they will loose their colour and flavour. Experience has shewn, that an handful only of under-dried hops will spoil many pounds of others, by taking away their fine smell and colour.

The best way of drying them is with a charcoal fire, on a kiln covered with hair-cloth, of the same form and fashion as is used for drying of malt, under which head this common sort of kiln will be more particularly spoken of hereafter. It is



found to suffice in places where only a few hops are raised, and a great deal of malt is made: but where the hop-planters have a much greater quantity of hops than can be dried in due time on their malt-kiln, (for hops, as was said before, ought to be dried as soon as possible after they are picked,) they build, in the following manner, several small kilns on purpose for drying of hops.

*EIGHT* or ten acres of hop-ground require a building of about sixty feet long, and fifteen wide in the clear. At one end of this building is a boarded room, to receive the green hops which are brought from the hop-ground, and which lie spread out there till there be room to put them on the kilns: at the end of the buildings is another large boarded room, for receiving the hops from the kiln when they are dried, and for them to lie in heaps to sweat till they are fit for bagging. In the intermediate part of the building, three or four kilns, of eight or ten feet square each, are constructed thus, close to one another.

If the middle building is, we will suppose, twenty eight feet long and fifteen wide, there will be room for three kilns of eight feet square each in the clear, and for their respective walls. These kilns should lie in a line along the back wall, and will come forward above nine feet; so that there will remain a passage five feet wide and twenty eight feet long at the front of the kilns.

To form each kiln, build the walls of brick, nine inches thick, and let each of the four sides be eight feet long in the clear, and seven feet high. The principal parts of the kiln are, in the upper part, the bed or floor whereon the hops are to be laid in order to their being dried; and in the under part, the furnace, steddle, or lanthorn, for the fire. The bed or floor in a kiln of eight  
feet

feet square should be about six feet from the lower floor, so that it will be about a foot below the top of the wall. This foot of wall rising above the bed, serves to keep in the hops on the kiln, and for men to walk upon round about the kiln, to look to the drying of the hops. The bed, or floor, may be made off wooden rails an inch square, laid very even and level, into a cross beam, a quarter of an inch asunder: or if the kiln be arched below, the floor may be laid with long bricks, or stones resting on the tops of the arches, at about two inches distance from each other.

In making the lower part of the kiln, place the mouth of the furnace at the bottom, in the middle of the front wall of the kiln, and let it be fourteen inches wide and sixteen high. Joining to the mouth of the furnace on the inside, build the steddle or lanthorn, of brick, four inches thick. This lanthorn should be fourteen or sixteen inches wide, three feet perpendicularly high in the side walls, and it should reach from the front wall of the kiln to within a foot and an half of the back wall; so that there will be room for a man to pass between it and the back wall, and the length of the lanthorn thus made will be about six feet. On it's side walls, bricks of a foot length are to be raised on their ends, leaning to and bearing upon one another, so as to form a covering like the roof of a house; or the top of the lanthorn may be regularly arched over.

In building the side walls of the lanthorn, after you have laid the two first rows of brick, leave at the end of every brick in the three or four following rows, an open space or hole, four or five inches wide, chequer-wise, both in the sides and in the back, and lay the uppermost row or two of bricks close together, as in the bottom rows, for the better support of the roof. By this means



there will be three or four rows of holes, which are designed to convey the heat equally to all parts under the hair-cloth. The roof should be well plaistered on the inside with hair and lime, that it may the better reflect the heat.

In the front-part of the kiln, on one side of the furnace, and at the height of two feet from the ground, a small door should be made, three feet high and two wide, so that a man may easily get in to set every thing to rights about the steddle. There should also be steps or stairs to go to the upper floor, where the hops are dried; and as there is a passage below, five feet wide, along the front of the kilns; so will there be, directly overhead on the upper floor, a like passage, which will be of use for bringing the green hops from their room, and laying them on the kiln, and for carrying them to the store room after they are dried. For greater conveniency, both these rooms should be on the same floor as the upper part of the kiln.

A farther caution necessary to be observed, is, that no holes be made within a foot of the fire-place or mouth of the furnace, and that all the parts about the kiln be constructed so close that no wind or air may possibly get in. The farther end of the steddle should be built of brick up to the top, with holes in it as in the sides.

The kiln should be square, and may be ten, twelve, or fourteen feet over at the top; but there should be a due proportion between the height and breadth of the kiln, and the size of the steddle where the fire is kept, viz. if the kiln be twelve feet square on the top, it should be nine feet high from the fire, and the steddle should be six feet and an half square; and so proportionably in other dimensions. These kilns are made at a small expence.

*IN* drying of hops, first lay the hair-cloth very even on the bed or floor of the kiln, and spread the green hops thereon, about six inches thick, laying them with a rake as smooth as possible, not thicker in one place than another. Let the kiln be moderately warmed before you lay on the hops; then keep an even and steady fire under them, but not too fierce at first, for fear of scorching them; and let not the fire slacken, but rather increase it till the hops are nearly dried, lest the moisture or sweat, which the fire has raised, fall back and discolour the hops. For these reasons chiefly it is, that no cool air should be suffered to come into the kiln while the hops are drying, and that wind, which would make the fire burn too violently, should not be permitted to blow on the mouth of the furnace. After the hops have lain thus about seven, eight, or nine hours, have left off sweating, and leap up when beaten with a stick, then turn them upside down with a broad malt shovel, or scoop made for that purpose, or cast them up into a heap in the middle, and afterwards spread them equally on all sides. Let them remain in this situation for two or three hours more, till every hop, if possible, be thoroughly and equally dried; and then with a hair-cloth, remove them to the heap where they are to lie till they are bagged. If they do not dry in one place so much as in the rest, which may be perceived by touching them with a stick or wand, and observing whether they rattle when so touched, as they will do when dry; make them thinner in the places where they rattle least. They must not be turned while they sweat; for that will burn them and make them lose their colour. The fire may be diminished a little before they are turned, and refreshed again afterwards: but those times excepted, the heat should be kept as equal as possible.



Hops are fully dried when their inner stalks become brittle and break short on rubbing, and when their leaves fall off easily and feel very crisp. When they crackle and leap a little, as they will do upon the bursting of their seed, then is the time to take them off the kiln.

If the fuel used for this purpose be either wood or turf, it should be charred first, because smoke spoils the colour and smell of hops. Char-coal made of old rotten poles is most commonly used. Cinders of sea-coal are also very good; and it is found by experience that Kilkenny coal dries hops perfectly well, because it does not smoke, and gives a constant uniform heat for a long time. The fire should be made at the mouth only of the furnace; for the air will disperse the heat sufficiently from thence to all parts of the kiln: and that it may be constantly of the same gentle degree, neither too strong nor too weak, it may be of service to make use of a thermometer, by marking upon which the degree of heat proper for drying hops, as soon as that degree is ascertained by experiment, you may always after know how to regulate your fire with great exactness: for, putting the thermometer within-side the kiln for a short time, you may observe, by the height of the liquor, when the heat is come to a right pitch, and when it is either too high or too low, and so encrease or slacken the fire accordingly. Any servant may, with the help of this instrument, be able to mend and correct the fire with great certainty, and not be liable to commit mistakes, which often prove exceedingly detrimental to the hops. —When you begin drying lose no time in the prosecution of that work, but employ people night and day, to attend it with the utmost care, till it be finished.—A large malt-shovel full of char-coal, thrown into the mouth of  
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the furnace of a kiln eight feet square, will last an hour.

It is observed that hops dried in the sun lose their richness of flavour, as other herbs do when they are dried that way. — If they are laid on a floor to dry, without using a fire, they will lose their strength, be apt to sweat or ferment upon change of weather, and not be fit for packing. Fire exhales their watery parts, and, by retaining the oily, preserves their flavour and colour.

*HOPS* break all to powder if they are bagged hot from the kiln. To prevent this, they should be laid in a heap, to sweat and grow tough; and if they are then covered for a while close with blankets, to keep the air from them, they will bag the better. There is no limited time for their sweating; that varying according to the weather: three or four days are commonly sufficient; but it is a certain rule, that when the hops feel moist and clammy, and can be squeezed in the hand, or trodden close, without breaking, they are then fit for bagging. The harder they are trodden, the better they will keep.

The bags proper for this occasion are made of coarse linnen cloth. They are commonly about eleven feet long, and near two yards and an half in circumference, and contain about two hundred and an half weight of hops. The small bags, called pockets, contain about half that weight.

The manner of bagging is thus: Make a round or a square hole, but a round one is most convenient, about twenty six or thirty inches over, in the floor of the chamber where the hops are laid in heaps after they are sweated. This hole should be large enough to receive the bag, and for a man to go up and down it with ease. Tie,  
with



with a piece of packthread, an handful of hops in each lower corner of the bag, to serve as handles for the more easy lifting or removing of the bag; and, with packthread, fasten the mouth of the bag to a frame, or hoop, somewhat larger than the mouth of the hole, that the hoop may rest on it's edges, and strong enough to bear the weight of the hops when the bag is full, and of the man who treads them. The upper part of the bag being thus fixed by the hoop, let the rest of it hang down through the hole; but not so near to the lower floor as to touch the ground: then throw into it a bushel or two of hops, and let a man go into the bag, and with shoes that have no heels, tread the hops down on every side, as hard as he can, till they lie close. Let more hops be then cast into the bag, and be trodden down, as before; and continue this till the bag is full. When that is done, untie it from the hoop, let it down, and sew up it's mouth as close as you can; observing at the same time to tie up some hops in the upper corners, as was done before in the lower. — The harder the hops are pressed, and the closer and thicker the bag is, the longer and better the hops will keep.

When they are thus bagged, lay them upon a boarded floor, and in a dry place; for dampness would injure them greatly. At the same time all proper measures must be taken to guard against rats and mice, which, though they do not eat hops, are very apt to spoil them, by making nests and lodging in them.

Some, in treading the hops, use a fifty pound weight, fastened to a rope and placed in the middle of the bag. The man in the bag treads about it with his feet, and lifts it up now and then, to press them the closer together.

AS soon as the hops are picked, strip their haulm or vines from off the poles, and, as your last work, lay the poles up so that they may be preserved. This is done either by stacking, piling, or housing.

The stacking is performed thus. Set up three poles, like an erect triangle, or rather six poles, let into the ground with an iron crow, and placed circularly, but inclining to one another so as to meet, and be tied fast together with bands of the haulm of the hops, within a yard of the top. The poles destined for the same stack should then be erected speedily against this frame; for if they are suffered to lie on the ground, especially in wet weather, they will receive more damage in a fortnight, than by their standing out, upright, all the rest of the year. When they are set up, about three hundred to a stack, bind them round with a rope of twisted haulm, to keep them together. By this means the outer poles only are subject to the injuries of the weather, and keep all the inner ones dry, excepting at their tops and bottoms, the former of which are, for the most part, exposed to the air, as the latter are to the moisture of the earth. It is therefore a good method to cover the top of the stacks of poles with haulm, and to lay stones, bricks, or sand, at their bottom, to preserve their but-ends from rotting.

Many choose to pile them up lengthwise in different parts of the hop-ground, laying three or four old poles athwart at bottom to preserve them from the dampness of the earth, and setting several poles erect in the ground on each side of the pile, to prevent it's slipping: they then lay the poles on one another, placing the smaller ends inward, and the bigger outward: so that the pile should consequently be somewhat longer than the poles: and when it is raised high enough, they  
bind



bind it across with ropes to haulm, to keep it upright and steady, and then cover it with haulm, to defend the poles from rain. This is a better method than the former : but the best way of all to preserve the poles, is to build in the hop-ground a shed or two, which may serve as a shelter for picking the hops in summer, and for laying up the poles in winter, with least danger of their being hurt or stolen.

*FROM* October to March there is nothing to be done in the hop-ground but to provide and bring manure into it, and to give the alleys their winter's digging or plowing.

If you bring dung into your ground, be sure it be well rotted, and lay it on the alleys to mix with the earth, but not on the hills ; dung being apt to produce vermin, which are extremely injurious to hops. Cold dungs, such as cows and hogs-dung, are better for hops than horse-dung, unless the soil be cold and wet, and then hot dung, such as that of sheep, and even of pigeons, will not be improper.

A small dunging every second year is sufficient, and a plentiful dunging will serve for three years, if the soil be tolerably good.

Dung was formerly more in use for hop-grounds than it is at present ; experience having shewn that lime, lime-stone, gravel, sea-sand, marle, especially the shelly marle, ashes, and many other manures and composts, which have been pointed out in the beginning of this work <sup>a</sup> as the most proper means of correcting the defects of soils, answer the end better, and last much longer.

The management of the hop ground during the third and every subsequent year (for it will

<sup>a</sup> See *Vol. I. c. 1.*

continue to yield good crops during upwards of twenty years, if it be rightly cultivated), is the time as above directed; so that it will require pretty constant care and attendance, especially from the beginning of March to the end of September. This you may lay down as a certain rule, that the more pains you take, and the greater expence you are at in the due culture of the ground and management of the hops, the greater will be your profit.

*THE* charge of an acre of hop-ground, in most parts of *England* where hops are cultivated, is computed thus: 3*l.* for the husbandry, 4*l.* for the wear of the poles, 5*l.* for picking and drying, 1*l.* 10*s.* for dung, 1*l.* for rent, and 10*s.* for tythe; in all 15*l.* a year: but in some places they pay 4 or 5*l.* an acre yearly for the rent of the land.

The hop-planters in *England* commonly agree with hop-dressers, to do, for 3*l.* to 3*l.* 10*s.* an acre, all the husbandry part, in which is included the summer and winter digging of the ground, the pruning and dressing of the hops and hills, the poling and tying, several hoeings and making up the hills from time to time, the laying of the dung on the ground, and all other work, except the bringing of the dung to the ground, and the picking and drying of the hops, which last businesses are performed by others: so that a gentleman has little trouble with his hop-ground: — he need only be careful that the undertaker does every part of the work in it's proper season; and it is so much the interest of the undertaker to be punctual in this, that, if he neglects hoeing when the weeds appear, he will, by such neglect, greatly multiply his trouble and labour in rooting them out afterwards.

An *English* acre requires about three thousand poles, the price of which varies according to their size.



size. In several places, it is usual to give as many shillings for an hundred poles, as the poles are feet long; so that, for an hundred poles of twenty feet long, they give twenty shillings: but where poles are in great plenty, they give but fifteen shillings for those of that length. A recruit of five hundred poles yearly will keep an acre of hop-ground in constant repair: so that poles are about a third part of the yearly charge, the picking and drying are estimated at another third, and the rest is laid out in the managing of the ground.

The hop-planters in England reckon that they have but a moderate return when the produce of an acre of hops does not sell for more than thirty pounds. They frequently have fifty, sixty, eighty, or an hundred pounds for an acre; nay, some have got considerably more than even this last sum for every acre of hops, at a time when the crops of other hop-grounds have failed in general, and theirs have succeeded. But if, on one hand, such extraordinary profit, being very uncertain, is not to be depended on; so, on the other, it should not be passed over quite un-noticed, because it is among the chances which may make amends for failing years. — Upon the whole, if the total charge of an acre of hops is computed, as above, at fifteen pounds a year, and it's produce, at an average of years, at thirty pounds only, the clear profit from an acre will be fifteen pounds a year.

Though it be common in England to see ten, twenty, thirty, or more acres of hop-ground in the hands of one man; and though some who spare neither care, industry, or expence, to make their plantations of this kind flourish, receive two thousand pounds a year for their hops, notwithstanding the high price of labour, manure, and every other article relating to their proper management; yet the intelligent husbandman will easily perceive

perceive, that it is not prudent for poor farmers, or men of small fortune, to engage far in this branch of improvement: for it requires a pretty considerable stock at first to cultivate a large plantation, to furnish it with poles, and to perform every other requisite. The expence will necessarily be great, and the undertaker must expect to lie out of his money for two or three years, before he can have any return of profit; — and even when his hops do come to their bearing state, and he is in hopes of making good the charges he has been at, a bad season may frustrate his expectation. — Small parcels of hops, suitable to the abilities of the farmer, for even the poorest may easily spare time and labour to plant a few of them in a corner of his garden, or other ground, and to set fallies, willows, or ash for poles in his hedges or elsewhere, will yield him a pretty profit, without his laying out any money: — so that, in setting forth the expences and risk which attend the cultivation of hops, I mean only to caution the husbandman, whose circumstances are but middling, against embarking too far in this branch of agriculture.

*GROUND* that is fit for the raising of hops, is also fit for the raising of Hop-poles of one kind or other. But to be more particular: low, wet, cold, marshy, boggy soils, or such as are situated near rivers, are fit for all the aquatic sorts, such as poplars, abeles, alders, willows, osiers, and fallies, which will produce hop-poles in four or five years from their first planting. If the soil be dry and warm, or a strong mellow rich loam, the ash and the chesnut, which make the best poles for hops, will thrive greatly therein, and be fit for poles in nine or ten years from the time of setting them: and if these are planted around the hop ground, they



they will both shelter the ground, and afford a supply of poles, without the expence of carriage. Elms also are quick growers; and when they are planted close together, they shoot up tall and strait, and make good poles.

Ash and chesnut poles, but especially those of chesnut, are so tough and durable, that three sets of them will last twenty years: but poles of alder, poplar, abele, osiers, or fallies soon rot, or become brittle; so that five sets of them, at least, will be requisite within that time. The aquatic kinds are therefore to be esteemed only for a first supply, till the plantations of ash and chesnut become fit for the future recruit of the hop-ground.

If the ground in which you design to plant alders, poplars, abeles, willows, osiers, or fallies, be very wet, make drains in it to carry off the super-abundant water: then, in the beginning of winter, dig the whole ground as deep as you can, divide it into ridges or beds six feet wide, and make a small trench of a foot and an half wide, and a foot deep between each bed. If this ground will bear plowing well, you may save yourself some expence; but you will find that trenching with the spade will make ample amends for the charge, by the quicker and stronger growth of the trees. The ground being thus prepared, set about planting it in February following. Poplars and abeles are generally propagated from suckers, and these should be planted as shallow as possible: but they may also be increased from large cuttings or truncheons, or from branches of the last year's growth. Alders, willows, fallies, and osiers are propagated from large cuttings or truncheons a foot and an half or two feet long, and the thicker they are the better they will be.

The truncheons should be cut sloping at the ends, and there should be two or three eyes towards each end. When you plant them, set them  
three

three feet asunder, and do not drive them down perpendicularly, but place them sloping in the earth, leaving about six inches above ground. Take care not to bruise or strip off the bark in thrusting them into the earth; but, to prevent this in ground that is stiff and hard, make a hole with an iron crow, or with a setting-stick, then put them into it, and afterwards close up the holes very firmly about them with fine mould. If the ground is loose, there will be no occasion for making holes with a stick.

These plantations should be kept clean from weeds during the two first years, by frequent hoeing: after that, they will of themselves keep down all weeds. All side-buds or shoots must be carefully rubbed off in the beginning of every season, to make the plants grow the taller and straiter. Preserve at first but one good leading shoot, or two at most, on these truncheons, and in four or five years they will be large enough to make poles. When these are cut down, you may preserve five or six good shoots on each stock, and thin them as you find occasion. Lay the cuttings of alder in water for the space of two days before you plant them; and let the poles from all these trees be cut either in October before winter comes on, or in February when the winter colds are past.

Ash thrives best in the richest soil, and is generally raised from its seed, commonly called *keys*: for the suckers of this tree seldom have good roots, nor do they grow with near so much vigour as those which are raised from keys. These keys are gathered about the end of November, when they begin to fall, or in the beginning of December. They should then be buried in a hole in the ground, placing a layer of keys and a layer of mould alternately till the hole is full, and they



should remain there till the February twelve-month, when they should be taken up and sown in seed-beds; or they may at first be put into seed-beds, where they should not be buried above two inches deep at most: but still they will not come up till the second spring after sowing. During this time, they should be carefully kept clean from weeds, and watered in very dry and hot weather.

When the young plants of ash are come up, they must be watered during the spring and summer, if the season be dry, and kept constantly weeded. In October following, take them out of the seed-bed with a trowel, to prevent their roots being strained in drawing; for when this happens, they not only never grow well, but generally perish, after they are transplanted. When you remove them from the seed-bed to the nursery ground, prune off their downright or tap-roots, but not any of their side roots. Their tops must not be cut in any manner till the second year after transplanting, but then their heads should be cut off within an inch or two of the ground, because this will make them shoot with great vigour in the next spring.

If the seedlings are small at the end of the first year, it is best to let them remain in the seed-beds a year or two longer, until they are large enough to transplant, which is when they are about the bigness of a goose-quill. Let the nursery ground be well dug, made very fine, and cleared thoroughly from weeds: then, in the beginning of winter, transplant the seedlings into beds in it, setting them a foot asunder every way, in strait lines, and leaving an alley two feet wide after every fourth row. When they have continued in this nursery two or three years at most, they should be transplanted into the places where they are to remain.

In transplanting them from the nursery, which should be done in October, or in February if you have slipt that time, take care not to bruise or spoil the roots, and preserve as much earth about them as you can. Let the ground be well dug and prepared some time before hand, and set the plants of ash in it three or four feet asunder. This soil should be good, and not wet; and it should be hoed and dug frequently about the plants during at least the first year or two after their being transplanted.

Another method of raising coppices or plantations of ash, which is attended with less charge and trouble than the former, and seldom fails of success, is this :

Make choice of very good land, and after giving it a summer's plowing to mellow it, and to destroy the roots of weeds and grafs, especially couch-grafs, prepare it for barley to be sown in the spring, and at the same time that you sow your barley, sow also ash-keys, but not at all thick. By this means, as the keys will not come up till the next spring after sowing, you will have the benefit of a crop of barley the first year. Early in the spring following, give the land a hoeing, which, though it should be little more than superficial, will help to mellow the earth, and loosen it so that the tender shoots of the seeds will pierce easily through it.

When the young seedlings have risen high enough to stand the hoe, thin them so as to leave but one promising plant at the distance of four or five feet from each other. The oftener the earth is stirred about the seedlings by hoeing it, the better they will thrive. In the beginning of the following winter, the surface of the ground should be lightly dug about half a spit deep, that the tender fibres may easily strike therein : after-



wards it should be hoed in the spring, when the weeds begin to rise; and these works should be continued till the shade of the nursery prevents the farther growth of weeds, which it will do at the end of three or four years.

There is likewise another way of planting young trees, which has been practised with success in several places at a small expence, and may be thus applied to the raising of hop-poles. Choose a piece of ley-ground, of a proper soil, and sheltered on all sides, especially the West; and lay it out in ridges, as for potatoes, making trenches a foot and an half wide and two or three spits deep: when you have laid the upper sod on one side of the trench, with the grass side downward, break the mould of it fine, and throw a little more fine earth from the trench upon it; then take a young ash from about ten to fifteen inches long, having before cut off the head to that length, and lay it on the fine earth, with the roots turned inwards, as in the planting of quicks; then cover it with three or four inches thick of fine mould taken from the trench, but leave about two inches of the top of the plant uncovered on the side of the trench. At two or three feet distance set another ash, in the same manner, and so proceed till you have planted the whole field. When you have laid the fresh mould on the roots, cut the grass sods which lie between each plant, and lay them over the fine mould upon the plant with their earth side downward; by which means the plants will have small hillocks of good mould about them, sufficient to defend them from drying winds and from the heat of the sun. Let the ridges be six or seven feet wide; in which case the trees will be two or three feet asunder in the row, and each row will be six or seven feet distant from another; so that all the trees will have sufficient air, and room to spread.



spread their roots, and may be very easily hoed or weeded. In planting trees after this manner, you dig but about a fourth of the ground : but for several years after, and until the trees are grown up to be large and spreading, half of the ridge may be made use of either for potatoes or for any other fruit or grain.

It is recommended as very material to the growth of trees planted in this manner, that the trenches be made from the South-west to the North-east, so that all the young trees may lie facing the south-east, by which means they will have the benefit of the sun, with least danger of being injured by the West, or North-west winds, which stint the growth of all young trees that lie exposed to them.

Elms, beech, and many other trees may be raised in great plenty, by planting in fine mould the small shoots of the last year's growth, after they have been slipped off from the larger branches. One large tree will furnish a great number of such shoots, which should be set in February, with their tops on, and watered in the spring. These plants seldom fail; and they furnish a supply of trees much sooner than can be obtained from suckers, layers, or feeds.

Some advise the sowing of chesnuts, acorns, and hazle-nuts with ash-keys; because say they, as some of these strike their roots deeper than others, they are less liable to rob one another of their due nourishment, than if they all rooted at the same depth. These nuts should be kept in moist sand from the time of their being gathered till they are sown, or otherwise their kernels will shrivel and perish.

Chesnuts make admirable poles. They should be sown in deep drills, and managed afterwards as the ash.



At nine or ten years growth, the ash may be cut for poles; and after the first cutting, each stock will throw out four or five good shoots at least, which will be fit for poles in seven or eight years after.

The season of the year for cutting ash-poles is about the middle of December, when their sap is most condensed by the winter's cold; and in the spring following they will shoot up again with vigour. Care should be taken to cut them off sloping at about six inches above ground. Some recommend that the face of the cut be towards the south, that the sun may the sooner heal the wound, by drawing up the natural juices to the surface of the cut, and drying them there; by which means the remaining stump or stock will be less apt to soak in wet: but others are afraid, that if the cuts lie towards the south, they will be more liable to crack, open, and let in rain. Experience must determine which way is best; or whether it be not worth while to cover these wounds with the same sort of prepared clay, or compost, as is used for grafting.

I hardly need to repeat here the caution before given in similar cases, *viz.* that all plantations of young trees should be constantly fenced in and guarded so that no cattle may at any time be able to brouse upon them, which they will not fail to do, if they can get at them: for if the leading shoots be bitten off, there is an end of that growth, and the only remaining chance then is, to cut down all such trees as have been thus cropped, to within six inches of the ground.

Hops are, like other vegetables, liable to various accidents and distempers, the principal and most fatal of which are the fly, the fen or mould, the mildew, and what the planters call fire-blasts.

The reverend Dr. Hales, treating of this subject in his excellent Treatise of Vegetable Statics, gives us the following account of the state of hops in Kent, in the year 1725, which he received from Mr. Austen of Canterbury, who was a very great planter, and an accurate observer.

“ In mid April, not half the shoots appeared above ground ; so that the planters knew not how to pole them to the best advantage.

“ Upon opening the hills, this defect of the shoot was found to be owing to the multitude and variety of vermin that lay preying upon the roots, and of which the increase was imputed to a long and almost uninterrupted series of dry weather for three months before. Towards the end of April, many of the hop vines were infested with flies.

“ About the 20th of May there was a very unequal appearance, some vines being run seven feet, others not above three or four, some just tied to poles, and some not visible; and this disproportionate inequality in their size continued through the whole time of their growth.

“ The flies now appeared upon the leaves of the forwardest vines, but not in such numbers here as they did in most other places. About the middle of June the flies increased, yet not so as to endanger the crop; but in distant plantations they were exceedingly multiplied, so as to swarm towards the end of the month.

“ On the 27th of June some specks of sen appeared. From this day to the 9th of July the weather was very dry. At this time, when it was said that the hops in most parts of the kingdom looked black and sickly, and seemed past recovery, ours held out pretty well, in the opinion of the most skilful planters. The great leaves were indeed discoloured, and a little withered, and the sen was somewhat increased.



“ From the 9th of July to the 23d, the fen increased a great deal ; but the flies and lice decreased, it raining much daily. In a week more, the fen, which seemed to be almost at a stand, was considerably increased, especially in those lands where it first appeared.

“ About the middle of August the vines had done growing both in stem and branch, and the forwardest began to be in hop, the rest in bloom : the fen continued spreading where it was not before perceived ; and not only the leaves, but many of the burs also were tainted with it.

“ About the 20th of August some of the hops were infected with the fen, and whole branches were corrupted by it. Half the plantations had escaped pretty well hitherto, and from this time the fen increased but little : but several days of wind and rain in the following week distorted the plants so that many of them began to dwindle, and at last came to nothing ; and of those which then remained in bloom, some never turned to hops, whilst many of those which did were so small, that they scarcely exceeded the size of a good large bur.

“ We did not begin to pick till the 8th of September, which is eighteen days later than we began before. The crop was little above two hundred on an acre of ground, and not good. The best hops sold this year at Way-hill for 16 l. the hundred.”

As a farther means of investigating of the cause of this pernicious distemper, Dr. Hales relates the following experiments, which he himself made on hops. — In the month of July, he cut off two thriving hop vines, near to the ground, in a thick shady part of the garden, and left the pole still standing. He stripped the leaves from off one of these vines and left them on the other, and then set

set their stems in known quantities of water in little bottles. That with leaves imbibed in a twelve hours day, four ounces, and that without leaves only three fourths of one ounce.

He took another hop pole with it's vines on it, and having carried it out of the hop-ground into a free and open exposure, these plants imbibed and perspired there double the quantity of the before mentioned which had leaves on it, in the hop-ground. This seems to indicate that the reason why the hop vines on the outside of gardens, where they are most exposed to the air, are short and poor, in comparison of those in the middle of the ground, is, because, being much drier there, their fibres harden sooner, and therefore they cannot grow so kindly as those in the middle of the ground, which, by the shade and shelter they afford each other, are always kept moister and more ductile.

From this perspiration of their fluid, the same attentive observer of nature forms the following calculation. — There being a thousand hills in an acre of hop ground, and each hill having three poles, and each pole three vines, the number of vines will be 9000, each of which perspiring four ounces, the sum of all the ounces perspired by an acre in twelve hours of day will be  $36000 = 15750000$  grains  $= 62007$  cubic inches, or 220 gallons, which being divided by 6272640, the number of square inches in an acre, it will be found, that the quantity of liquor perspired by all the hop vines will be equal to an area of liquor as broad as an acre, and  $\frac{1}{101}$  part of an inch deep, besides what is evaporated from the earth.

Now this quantity of moisture, in a kindly state of the air, if daily carried off, is sufficient to keep the hops in a healthy state; but in a rainy moist state of air, without a due mixture of dry weather, too much moisture hovers about the hops, so as



to hinder, in some measure, the kindly perspiration of the leaves, whereby the stagnating sap corrupts, and breeds mouldy fen, which often spoils whole tracts of till then flourishing hop-grounds.

This was the case in the year 1723, when, for twelve or fourteen days, almost continual rains fell, about the latter half of July, after four months of dry weather; upon which the most flourishing and promising hops were all infected with mould, or fen, in their leaves and fruit, while the then poor and unpromising hops escaped, and produced plenty, because they, being small, did not perspire so great a quantity as others, nor did they confine the perspired vapour so much as the large thriving vines did in their shady thickets.

The planters of hops remark, that when a mould, or fen, has once got possession of any part of the ground, it soon over-runs the whole, and that even the grass, and other herbs under the hops, are infected with it. The reason probably is, that the exceeding small seeds of this quick growing mould, or moss (for such in fact it is), coming soon to maturity, are easily blown over the whole ground; and it is undoubtedly owing to the same cause, *viz.* to the remaining dispersed seeds of the preceeding year's fen, that some grounds are infested with this distemper for several years running. The means before pointed out<sup>a</sup> for curing the moss on fruit trees should therefore be assiduously recurred to here, at least so far as they can be applied to hops; and, at all events, particular care should be taken to keep the land always in fine tilth, constantly free from weeds, and to burn all the fenny hop vines, in a place remote from the garden, as soon as they are picked. We have already seen<sup>b</sup> instances of the cure of moss upon fruit trees, by

<sup>a</sup> Page 305—207.

<sup>b</sup> Page 306, 307.

the use of hog's dung; and there is no room to doubt the efficacy of the same remedy when applied to mouldy, or mossy, hops.

Mr. Austen, of Canterbury, observes that the fen is more fatal to those grounds which lie low and are closely sheltered, than to such as have a high, and open situation; to those that lie shelving to the north, more than to those whose slope is towards the south; to the middle of hop-grounds, more than to their outsides, and to dry and light grounds more than to moist and stiff soils. This was very apparent throughout his plantations, where the land was prepared and planted in the same manner, and at the same time.

The conjectures which have been offered in former parts of this work<sup>c</sup> concerning the causes and nature of honey-dews and of mildew, together with the account of the methods which have been, or may be, used with the greatest probability of success, either to guard against them, or in some measure prevent their bad consequences, are, though there applied particularly to corn and to fruit trees, likewise applicable to hops. I shall therefore only add here, that the honey-dews are most apt to fall upon hops a little before the middle of June, and that, by the middle of July, they turn their leaves black, and make them stink. —The mildew which lights upon hops is a white dew; that falls in summer at sun-rise, chiefly when the hops are in flower. Its fall is so unequal, that it sometimes embraces a whole district, and sometimes only parts of it. This dew dries up the hops, withers and consumes their leaves, and consequently ruins the crop. “There is”, say the authors of the *Journal Oeconomique*, whose account of this distemper, to which hops are extremely

<sup>c</sup> See Vol. II. p. 409—418, and Vol. IV. p. 304—315.



liable, I shall copy here <sup>d</sup>, “no other remedy from nature against this mischance, except rain sufficient to wash the plant, and clear it entirely from this fatal dew: but as rain seldom comes quite seasonably to the relief of the plant thus affected, artificial means have been sought, for insuring it against this accident. Some have surrounded their hop-grounds with hogs dung; others have employed persons to go through the ground with vessels full of beech ashes, and to throw them upon the hops while the mildew was falling; and both sides, profiting by their experience, pretend to have found a specific preservative against the bad effects of the mildew. They have even proceeded so far, as that each side affirm their’s to be the only remedy. Those who use hog dung say, that the ashes may probably hinder the action of the dew upon the plant; but that they must, at the same time, stop up it’s pores, and deprive the soil of it’s humidity; a circumstance equally ruinous to the plant: and that, besides, beech is not to be found every where, and if it must be brought from afar, the remedy would in some measure become impracticable, by the scarcity and difficulty of procuring it. — The partisans of the ashes say, that they cannot comprehend how hog dung laid round the hop-ground in the spring, should preserve such virtue as to destroy the bad quality of this mildew in the summer. In short, to render this discussion complete, each side alledges, that the trials which they have made of the other’s remedy did not succeed.”

<sup>d</sup> Or rather, not having the original of that work at present by me, I shall take it from the *Select Essays on Commerce, Agriculture, Mines, Fisheries, and other useful Subjects*, translated from chosen parts of the *Journal Oeconomique*, and published here by Mess. Wilson and Durham, in the year 1754.



“ This dispute, the subject of which is highly interesting to all countries where beer is the common drink, excited a naturalist to examine the nature of this mildew; and with the assistance of a microscope he perceived it to be full of the eggs of little insects, which fly in vast numbers in the air while the hop is in blossom. These insects gnaw the leaves even of trees, and, like others of their species, undergo various metamorphoses. This discovery induced him to believe, that, as insects are not apt to attack perfectly healthy trees, or vigorous plants, but only such as are feeble and sickly (they being induced with such nice sensations as to distinguish by the outside only, perhaps by the smell, a plant which is vitiated within, though it may appear to us to be quite fair and sound), hog dung might probably give such vigour to the hop, as to render these little animals afraid to attack it: for it has been remarked, that the insects which nip a leaf, leave it as soon as they find in it an abundant juice, the salts of which, it may be presumed, are too strong for them; and that they fix on those only which begin to decay and lose their sap. — Ashes may likewise have the power of hurting them, and it's salts may be capable of giving them disturbance. But late experience hinders us from giving entire credit to these two remedies, and shews, that if they have sometimes preserved hops from the effects of the mildew, we are not to conclude that they will always answer this desirable end. A very good husbandman saw his hops spoiled by the mildew, notwithstanding the dung with which they were surrounded, and the ashes that were thrown upon them: in a little time, the leaves of the plants were covered with millions of small white insects. The ashes indeed seemed to kill them; but, as was observed above, they at the same



same time deprived the soil of it's necessary moisture. Desirous of saving his hops, he recollected an axiom in medicine, importing, that bitter things kill worms: *Amarum necat vermes*. He then ordered a quantity of wormwood to be bruised, and having infused it in water, he sprinkled his hops with the infusion by means of a forcing pump: but he was too late, the hops being already destroyed. A clergyman in his neighbourhood, who was well versed in matters of agriculture, and to whom he related his bad success, answered, that when such an accident happened to him, he, without giving himself so much trouble, ordered his people to strip off immediately all the leaves of his hops, and that, the stalks pushing out other leaves, he had at least one half, and sometimes two thirds, of his ordinary crop<sup>e</sup>

“The publication of the above account concerning hops,” add the writers of the *Journal Oeconomique* (whom I continue to copy) in one of their subsequent papers, “has excited a skilful farmer to communicate his experiments on this subject. The reader will perceive by following extract of his letter, which we are impatient to publish to the world, the obligations that are due to him from all those who cultivate hops, and the credit he deserves in what he relates.

“I was informed some years ago, that hog's dung  
 “might be employed to great advantage in hop-  
 “gardens: nevertheless, as I could not conceive  
 “the reason of the advantage which the hops de-  
 “rived from that sort of dung, I gave myself no  
 “trouble about using it preferably to any other: but  
 “having this last year lost almost all my hops by

<sup>e</sup> This agrees perfectly with M. de Chateauvieux's experiment of cutting off the mildewed blades of corn. See Vol. II. p. 409, 410.

“ the mildew, and having observed but one single  
 “ place where the fruit remained entire and in a  
 “ perfect state, I found, upon diligent inquiry,  
 “ that my servants had laid hog’s dung upon that  
 “ very spot, precisely where the mildew had not  
 “ injured the fruit: I am therefore convinced of  
 “ the good effects of this dung in hop-gardens,  
 “ and the more so, as I am certain that my land  
 “ was prepared with dung of all sorts. The far-  
 “ mer will therefore find his account in using for  
 “ his hop-grounds all his hogs dung, (which, it is  
 “ likewise to be considered, is in general thought  
 “ to be the least serviceable to corn lands), and in  
 “ covering his hop-trenches, both in autumn and  
 “ spring, with the same kind of dung new, before  
 “ it is rotten.”

The latter part of this letter is calculated for  
 such general utility, that I cannot refrain from  
 adding it here, though at the hazard of digressing  
 from my present subject. The directions given  
 in it are indeed uncommon; but I can hardly  
 suppose that the writer of it would instance facts,  
 without having a foundation for so doing.

“ When hops are scarce, their leaves and sprigs  
 ought to be gathered, for several useful purposes;  
 but they must be gathered with great care: no  
 leaves should be taken but such as are clean,  
 young, whole, and green; and only the tips of the  
 sprigs that are green, young, and full of juice.  
 They must be dried in a very clean and airy  
 place.

“ These may be used in brewing, for an after-  
 beer, or for common small beer: for by throwing  
 in the leaves and sprigs of hops, that beer acquires  
 additional strength, becomes the more wholesome,  
 and will keep the longer.

“ The leaves and sprigs of hops are, during  
 the excessive colds of winter, an excellent cordial  
 to



to cattle, whom they strengthen prodigiously. The method of using them is to infuse them in boiling water, and to mix this infusion with the ordinary drink of the cattle.

“Cattle may be still more strengthened, by mixing with their drink the tops of pines or firs; and to render these the more efficacious, it is proper to boil them in a kettle, that all the resinous substances may dissolve, and to pour the extract into their drink. Some of my cows, then kept on a little farm which is surrounded with mountains, were so affected by a prodigious cold, that the very marrow was almost frozen in their bones: they lay helpless upon the ground, and, though the best of fodder was given them, could not use their limbs or rise up. I can ascribe to no other cause than the remedy which I have just now pointed out, the surprizing cure of these animals. In one month's time, they were so well recovered, that they rose without any assistance, and ever since they have resisted the most violent cold without being in the least affected. The singularity of this event determined me to impart it to you, in order that every body may, upon the like occasion, have recourse to the same remedy.”

As to the Fire-blast, as it is commonly called, I must again acknowledge, that Mr. Miller's repeating word for word, under the article *Lupulus* (the Hop), the whole of what he had said before upon this subject in the article *Blights*, in his Gardiner's Dictionary, does not render his ratiocination one jot the less unintelligible to me. I must therefore refer the reader to my former observation<sup>f</sup>, and can only add here Dr. Hales's relating, that, in the month of July, which is the season when this blight is most apt to affect hops, he had seen

the vines in the middle of the hop-ground scorched up almost from one end of a large plantation to the other, when a hot gleam of sun-shine came immediately after a shower of rain; and that, at such times, vapours may be observed, with the naked eye, to ascend so plentifully as to make an object which was before clear and distinct, become immediately very dim and tremulous. It was therefore, probably, owing to the much greater quantity of vapours in the middle of the hop-garden, than there was towards it's skirts; and that middle being the densest medium, the rays of the sun may have been collected nearer to a point by passing through that denser medium, than they were in the outer parts of the ground. — The course of the scorch was at right angles to the beams of the sun at about eleven o'clock, at which time the hot gleam happened. — The hop-ground was in a valley which run from South-west to North-east, and, to the best of the Doctor's remembrance, there was but little wind, and that in the course of the scorch.



## ERRATA.

- p. 297, l. 6. *for* when he returned from *read* at the time of.  
336. l. 25. *for* grew in the *read* grew as in a.  
353. l. 10. *after* abundance *add* of, and l. 11. *dele* of.











